

AMERICAN ARTISAN

**MAY
1942**



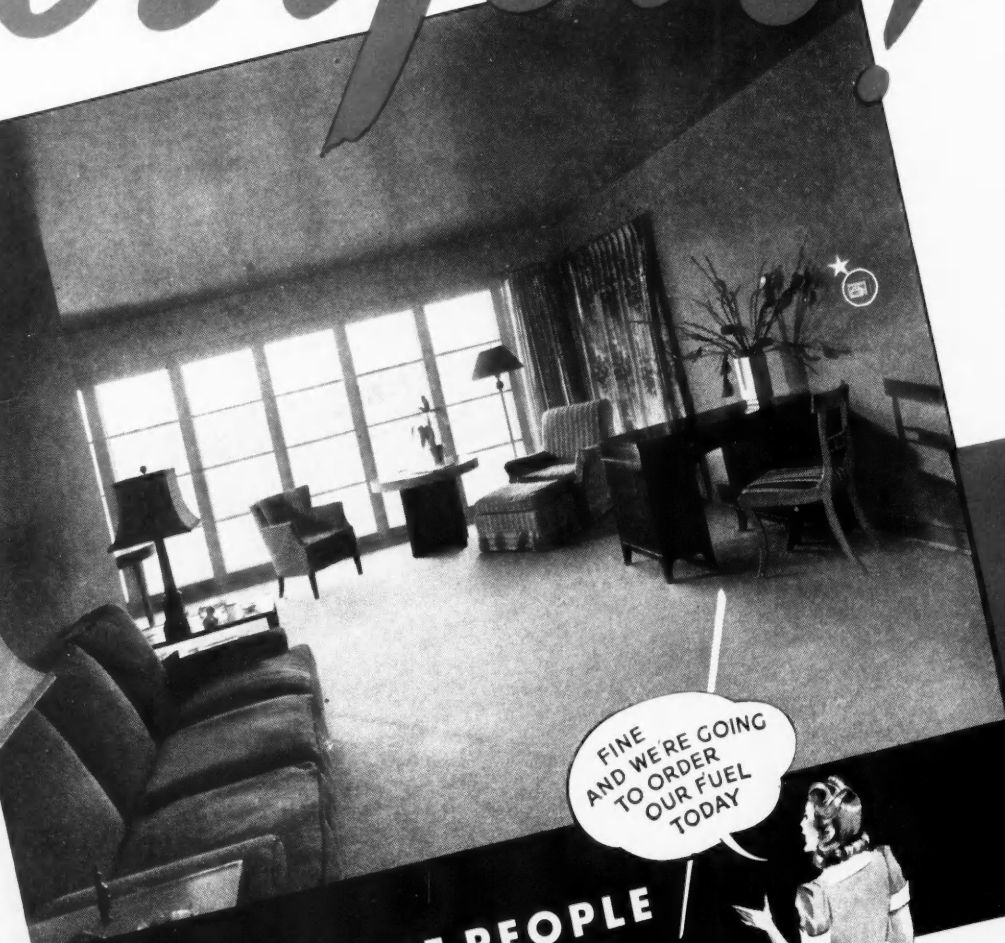
RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1888

For You!



NOW YOU'RE
ALL SET FOR
NEXT WINTER
MRS. SMITH



FINE
AND WE'RE GOING
TO ORDER
OUR FUEL
TODAY



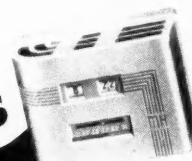
THE SMITHS ARE WISE PEOPLE AND THRIFTY TOO

M-H Advertisements
like this are currently
appearing in National
Magazines. They tell
your story, to millions
of home owners . . .

For You!

UP TO NOW, you've probably just taken your Automatic Heating Service Man for granted. You knew he was available when you needed him — but you didn't need him very often . . . But now you *really* need him. Your automatic heating plant must last the duration. Have your service man check your system thoroughly at regular intervals — starting now! It won't cost much and it may save your plant — or possibly far greater expense or inconvenience later. Don't delay! Do it now! Get ready for fall, and also order next season's fuel supply. It will relieve delivery congestion and means just that much more storage capacity in your community. Write for free booklet on fuel saving, "Contribution to Better Living." Minneapolis-Honeywell Regulator Co., 2745 Fourth Ave. South, Minneapolis, Minnesota.

★ ★ ★ ★ AUTOMATIC HEATING and
MINNEAPOLIS-HONEYWELL CONTROLS
are Essential



the
Chronotherm
THE NEW CLOCK
THERMOSTAT THAT
SAVES FUEL.

ONE OF A SERIES ON BEHALF OF THE AUTOMATIC HEATING INDUSTRY BY MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. MINNEAPOLIS, MINNESOTA — TORONTO, ONT., CANADA



A century of service—through peace and war—in good times and bad—Ryerson has served the building and sheet metal working industries of America. Ten Ryerson Plants are strategically located for prompt, dependable steel-service. Our steel stocks, which normally contain over 11,000 different kinds, shapes and sizes, have been greatly reduced by the demands of the war. However, our remaining stocks are offered in accordance with the Government Priority Plan. We are always glad to work with you and offer our help in the most effective application and fabrication of all steel products.

Partial List of
Ryerson Steels

Bars—Plates
Structurals
Sheets—Strip
Alloy and Tool
Steels
Stainless Steel
Tubing
Reinforcing Bars
Welding Rod

Joseph T. Ryerson & Son, Inc. Chicago • Milwaukee • Detroit • St. Louis • Buffalo • Boston • Cincinnati • Cleveland • Jersey City • Philadelphia

AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES
AND
SHEET METALS

AND

Warm-Air
Heating

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 111, No. 5

May, 1942

Founded 1880

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In This Issue

THE editors (and probably many readers) slipped into the notion that our industry in April was just about regulated to the "ceiling", but the six major orders which were issued since April 16 brings us up with a jerk. If you think the end is in sight, we urge you to study the latest orders beginning on page 30.

And in making up these pages the thought came—"Is there any other industry which now operates under as many orders as we do?" So we went back through the WPB list and took off the orders which affect us directly and indirectly. If you will read the editorial on page 25 we believe you will agree that our question is justified.

There's evidence, we think, in this list of orders, regulations, limitations, we are trying to follow why operation of our business sometimes bears all the ear-marks of a nightmare.

To those industries which were arbitrarily put out of business we extend our sympathy, but trying to live up to all the rules we are compelled to follow surely raises the question of whether its better to take the cold plunge at one jump or to be strangled slowly as we seem to be.

With materials getting more and more difficult to get, the study of acceptable practice in the use of substitute materials for ducts and fittings beginning on page 38 is, we hope, both timely and valuable. If you have developed other ideas for substitute ducts and fittings, send us your sketches and suggestions. Everyone needs all the help available.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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More than 8,000 copies of this issue are being distributed

SAL-MO ASBESTOS PRODUCTS



SAL-MO ASBESTOS DUCTBOARD No. 77

A MODERN material, made of Asbestos and developed especially for use in constructing cold air return ducts in warm air heating plants.

USE IT INSTEAD OF METAL—Sal-Mo Ductboard No. 77 conserves metal for work where metal only can be used. It cannot rust out, a feature superior to sheet metals.

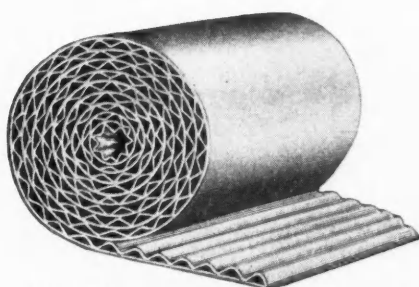
FIREPROOF — Made of Asbestos throughout it is fireproof and can be used safely near electrical wiring without danger of short circuit and fire.

MOISTURE RESISTANT—Treated on both sides and on all four edges. It can be used for all duct lining.

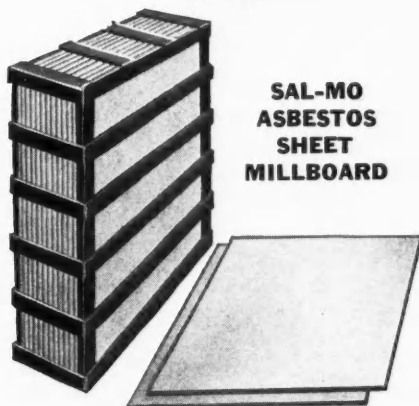
EASILY AND QUICKLY APPLIED—Sheet size is 33" x 48", 1/8" thick, exactly right for covering 3 joists spaced at 16" centers, making 2 return ducts. Cut it with saw, knife, or snips and apply with hammer and wallboard nails or with stapler.

ATTRACTIVE IN APPEARANCE—Smooth and light gray in color. Easy to keep clean. May be painted or plastered.

It is acceptable on cold air returns where galvanized sheet metal was formerly required. It is being extensively used in many FHA Housing projects.



SAL-MO ASBESTOS CORRUGATED PAPERS



SAL-MO ASBESTOS SHEET MILLBOARD

OTHER Asbestos Products manufactured by Sall Mountain Company have earned an enviable reputation with Warm Air Heating Contractors and installers and leading Jobbers.

Expert workmanship and the finest materials go into Sal-Mo Asbestos Products.

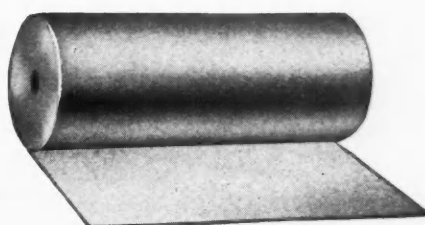
SAL-MO ASBESTOS PAPER AND ROLLBOARD—Made of the finest grades of asbestos fibre produced in our own mines, making a smooth, strong, white sheet.

SAL-MO ASBESTOS CORRUGATED PAPERS—Fireproof, for insulating hot air pipes, ovens, furnaces, etc.

SAL-MO ASBESTOS SHEET MILLBOARD—A strong board for insulating stoves, ovens, electrical wiring and heating appliances, and for protecting ceilings and walls.

SAL-MO ASBESTOS PIPE-JOINT TAPE—For covering both hot and cold air pipe joints and for sealing cracks. Easily and quickly applied.

SAL-MO ASBESTOS BLACKOUT BOARD—Fireproof and water repellent; easy to use and economical. It prevents damage from flying glass in event of bombings and other explosions. Investigate this new product.

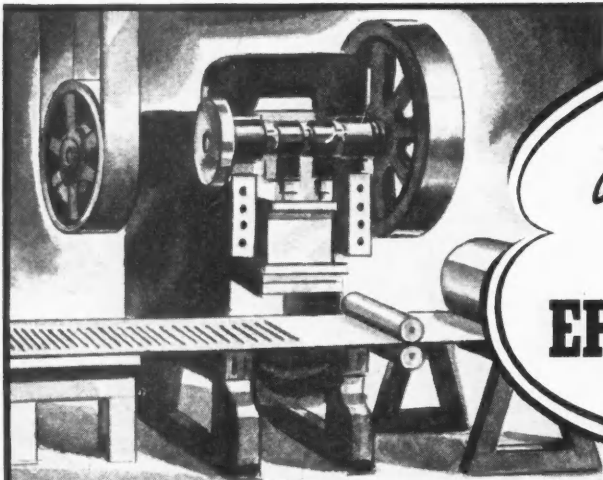


SAL-MO ASBESTOS PAPER AND ROLLBOARD

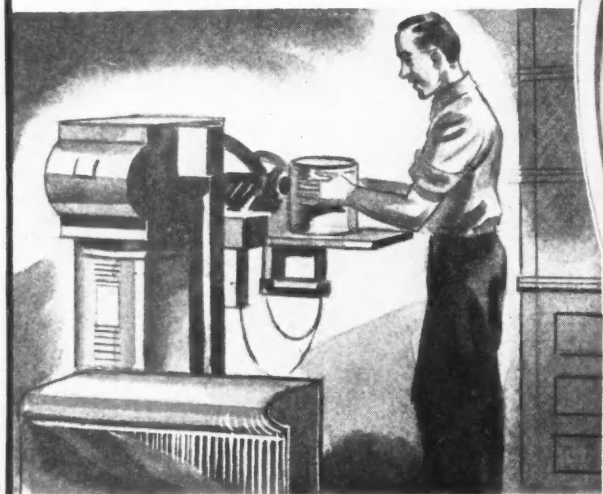


SAL-MO ASBESTOS PIPE-JOINT TAPE

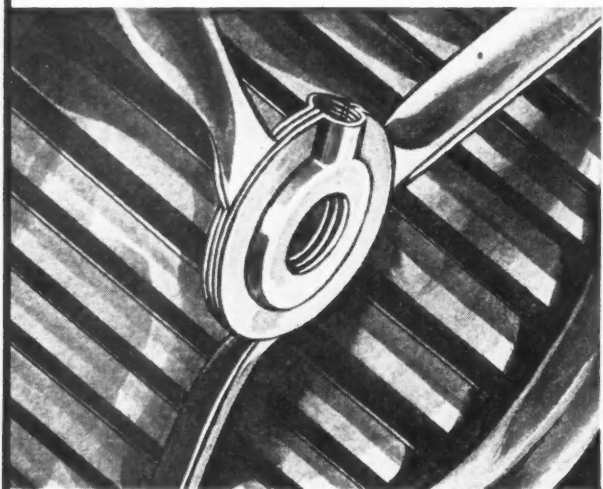
SALL MOUNTAIN COMPANY
176 West Adams Street Chicago, Illinois



Progressive dies produce complete blade group



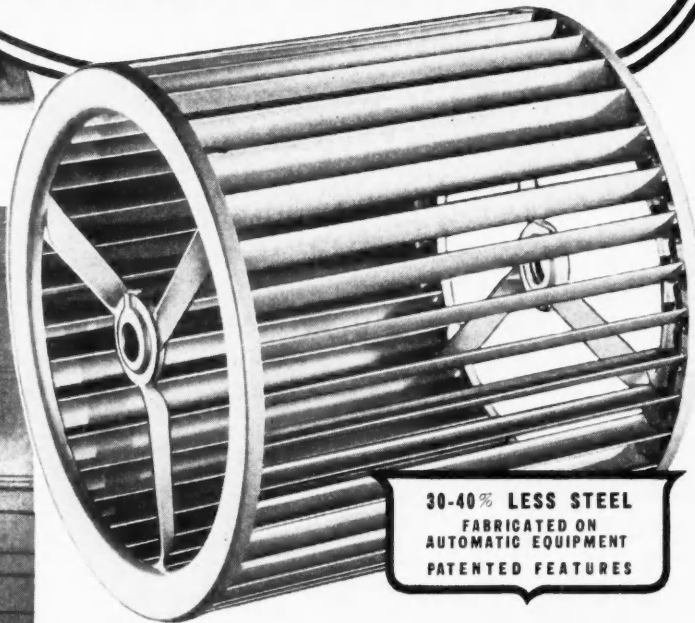
High speed assembly on automatic welders



Patented hub construction eliminates costly cast iron or screw machine hubs

MORRISON

Airstream BLOWER WHEELS
ARE THE RESULT OF
EFFICIENT PRODUCTION



30-40% LESS STEEL
FABRICATED ON
AUTOMATIC EQUIPMENT
PATENTED FEATURES

THE AIRSTREAM blade section is made in one piece from coil stock on progressive die equipment. End rings are produced on high production compound dies. Machining operations are reduced to a minimum. Assembled on power-driven automatic feed spot welder. Consult Morrison Engineers on building your own blower assemblies on furnaces for defense housing. Appreciable savings will result.

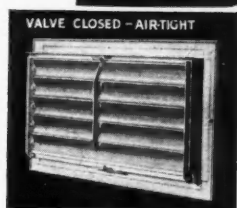
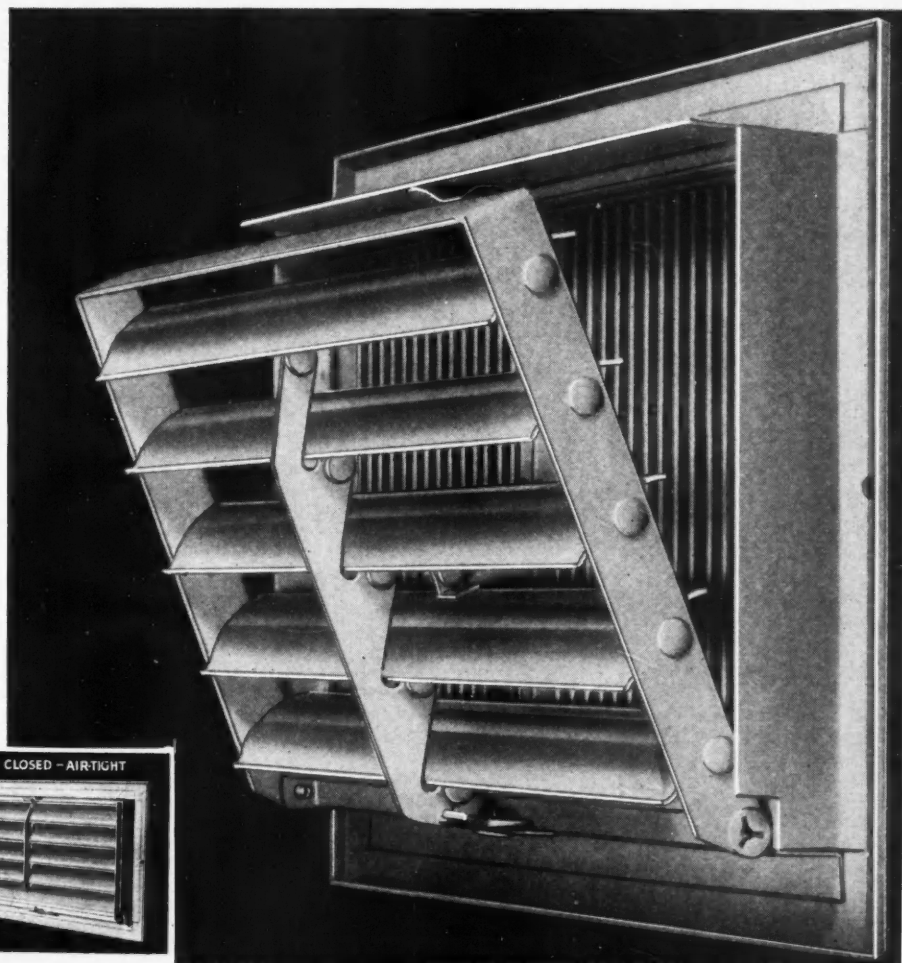
MORRISON PRODUCTS, INC.
EAST 168TH & WATERLOO ROAD
CLEVELAND, OHIO

MORRISON IS CONTRIBUTING TO VICTORY BY CONSERVING STEEL!

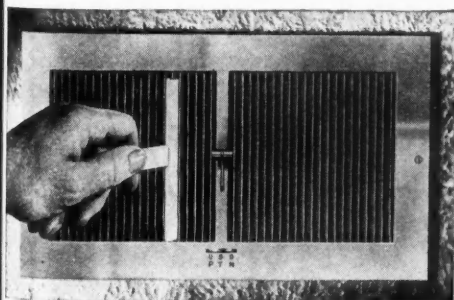
SE **H&C** REGISTERS with the INCOMPARABLE TURNING BLADE VALVE

*More
Expensive?*

NOT AT ALL !



Closed, the turning blade valve is air-tight. To adjust the blades to UP, STRAIGHT, or DOWN requires just a turn of the regulator at the front of the register as shown at left.



The H & C No. 75 Design incorporates both the Turning Blade Valve and quick adjustability to any sideway deflection desired. Sideway deflections are quickly obtained by simply twisting the flexible fins with wrench furnished with each item.

The TURNING BLADE VALVE, used in H & C Nos. 75 and 86 Registers, is the only directional valve which when open extends back the full depth of the duct, smoothly dividing and turning every bit of the air flow with equal velocity to every portion of the register face. The result is less turbulence, less resistance and better distribution to the farthest parts of the room.

When you consider that H&C Registers having the incomparable TURNING BLADE VALVE, provide more even distribution, that they eliminate "draft sensations", that they thus provide far greater customer satisfaction, you might naturally presume they would command a premium price. Actually, they cost not one penny more than the conventional double deflection registers. Hence, whenever a job calls for double deflection registers, propose H&C registers with the TURNING BLADE VALVE and you'll definitely step up your chances of getting the business.

For every type of wartime housing installation—air conditioning or gravity—the H&C line provides a better register with no premium asked for added quality.

HART & COOLEY MANUFACTURING CO.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain •

HOLLAND



MICHIGAN

Chicago Office: 61 W. Kinzie St.

Philadelphia Office: 1600 Arch St.

Current Catalog: No. 42 combining Gravity, Air Conditioning and Furnace Accessory Lines. If not on hand, write us.



Here comes Dust-Stop* with a whopping new free sales plan!

DEALER HELPS FOR SPRING, SUMMER, AND FALL

Striking newspaper mats—the same kind that sent thousands of customers to Dust-Stop dealers, last year. No charge.

Lively mailing pieces—timed to the Spring and Fall filter-changing seasons. Your name and address imprinted free . . . on any amount you want!

Reminder postcards—follow-ups for the mailing pieces. Adapted to the season. Include your name, address, and phone number. Postcards, mailing pieces, newspaper mats, all push filter-replacing *plus* furnace-repairing and your other services.

RADIO SCRIPTS—WINDOW AND COUNTER DISPLAYS—FURNACE LABELS—WOW!

Radio spot announcements—already to go on the air and boost your name and business.

Window and counter displays—attention-getters and customer-catchers that come with the other helps.

Furnace labels—put your name and address constantly in front of householders.

Classified Telephone Directory listings—you get a free Fiberglas Dust-Stop ad to sign your name to, pay only the low local rate for your own listing.

Follow-up card file—helps you keep track of when your customers are ripe for business. File box complete with cards, only 25¢.

A tie-in chart—shows how to time your advertising with Dust-Stop's national advertising—reaching over 10,000,000 readers of Life, Saturday Evening Post, Better Homes & Gardens, and American Home!

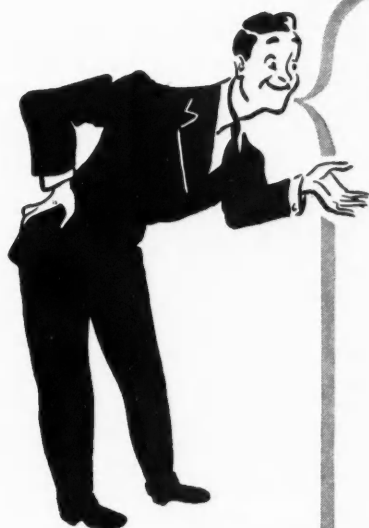
AN EXTRA-BIG SALES PLAN FOR AN EXTRA- HARD YEAR

1942 IS TOUGH, sure. But not *too* tough for the boys who'll drive and dig for business. This year's Dust-Stop Sales Plan—the biggest filter sales plan ever—has the rock-'em, sock-'em sales drive you need in these times. Get it out there digging up filter replacements for you. Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.

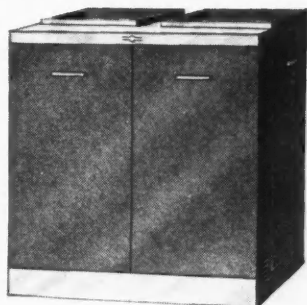
Ask your distributor to show you Dust-Stop's new Free Sales Plan—"Pulling Profits Out of the Air" . . . He can take your order for the sales helps.

FIBERGLAS*
DUSTSTOP*
* T.M. Reg. U.S. Pat. Off.
AIR FILTERS

How YOU can aid the war effort with **OIL-SAVING** heating equipment



**OIL-SAVING G-E heating units now
on hand for immediate delivery!**



G-E WINTER AIR CONDITIONERS circulate conditioned warm air heat—filtered and humidified. In three sizes for various heating requirements.



G-E OIL BURNERS use far less oil than obsolete, inefficient conversion burners. Easily installed in one day.

Here are your two immediate markets

1. *For new war housing remodeling projects*

By converting old-fashioned residences into several living units, 420,000 apartments will be created to house war workers. Oil-saving G-E units are ideal for heating these important remodeling projects.

2. *To replace wasteful, obsolete oil burners*

There are many homes in your territory where oil is now being wasted by old or inefficient burners. Replace them with modern G-E units that wring every bit of usable heat from every drop of oil.



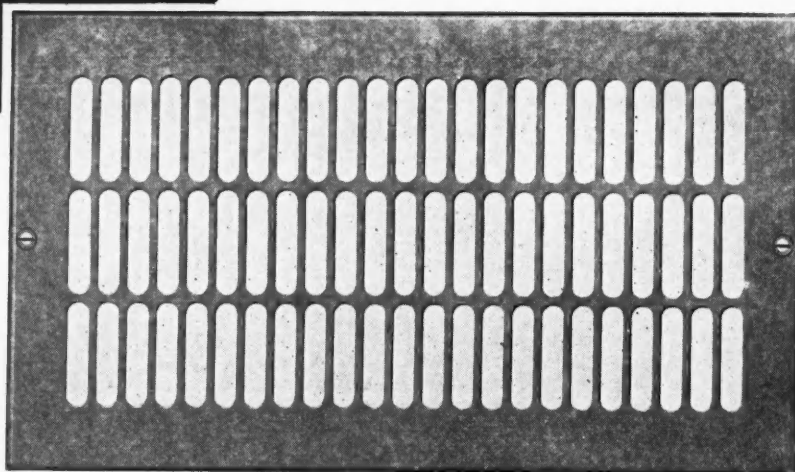
TURN TO →



The General Electric equipment shown above fits right into present war conditions. It's available for immediate delivery. It saves oil, which becomes increasingly important every day. It offers you real opportunities to aid both the nation's war housing and fuel conservation programs. General Electric Company, Division 2535, Bloomfield, New Jersey.

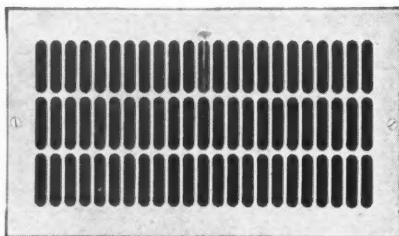
===== **GENERAL**  **ELECTRIC** =====

*For
Low-Cost Housing
use AUER REGISTERS*



With the widespread use of simplified heating systems, sometimes stripped to the bare functional essentials—defense homes need the added efficiency of Auer Registers. There are several Auer warm-air models particularly suited to such requirements.

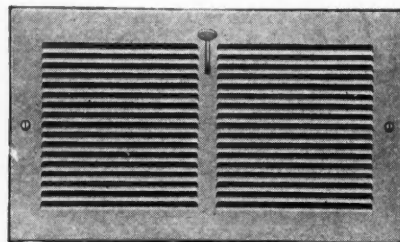
The Classic Register shown above is a highly popular design and, furnished with single louvre, it is practical for low-cost warm-air jobs. It can also be furnished for air conditioning, with multi-louvres, either vertical or horizontal blades, for any desired diffusion.



No. 6032 Classic Wall Register

Auer makes several other models which come within the cost requirements of the small home market, and offers a full, modern line of wall and baseboard registers with bendable fins for up or down deflection—such as our Airo-Flex "7000" Series and Heat-Rite Series. Where extra strength is required for floor models, use DuraBilt Floor Registers and Intakes. If you are equipping defense projects, group housing, or low-cost single homes—it will pay you to have full information on the complete Auer line.

Write for Auer Register Book showing all models for warm air and air conditioning. Separate Catalog "G" also available on flat metal grilles.



Airo-Flex 7032 Single Louvre Adjustable Register

THE AUER REGISTER CO., 3608 Payne Avenue, Cleveland, Ohio

AUER REGISTERS
& GRILLES · For Air Conditioning *and* Gravity

Look to

CENTURY MOTORS

For Quiet-Starting and Quiet-Operating
Power for Unit Heaters,
Air Conditioning Fans and Blowers

War Plant Expansion Opens Big Priority Markets for You

★ Whether you buy, manufacture, sell, or install motor driven heating or ventilating equipment, it's to your advantage to be sure that the electric motor drive accurately meets the demands of every job.

The specialized demands of unit heaters, ventilating and air conditioning fans and blowers present an opportunity for better performance through the selection of motors designed for these specialized jobs.

To meet these conditions,

Century Motors offer you a wide range of types and sizes, fractional and integral horsepower.

Today's enormous expansion of war production provides contractors with a vast market for priority business of this type—and on war contracts you'll find shipments of Century Motors especially satisfactory right now.

We invite you to bring your motor problems to Century—your nearest Century Sales Engineer is always available for consultation and advice.

CENTURY ELECTRIC CO., 1806 Pine Street, St. Louis, Missouri

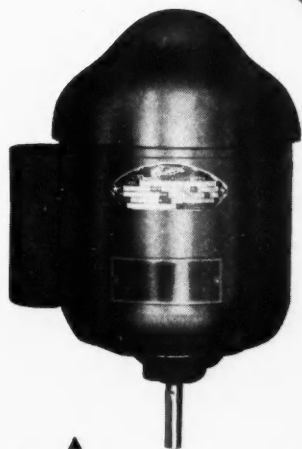
Offices and Stock Points in Principal Cities



One of the Largest Exclusive Motor
and Generator Manufacturers in
the World

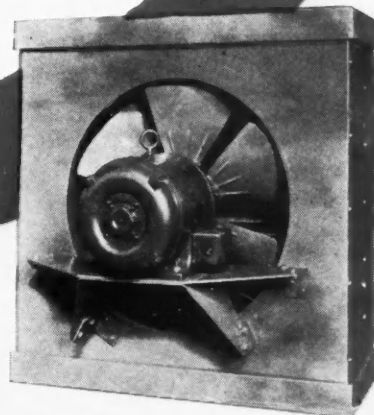
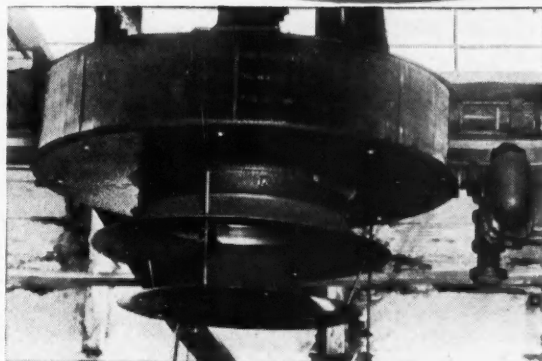


▲ 1/6 H.P. capacitor start cushion mounted motor



▲ 1/6 H.P. capacitor start vertical ball bearing motor

279

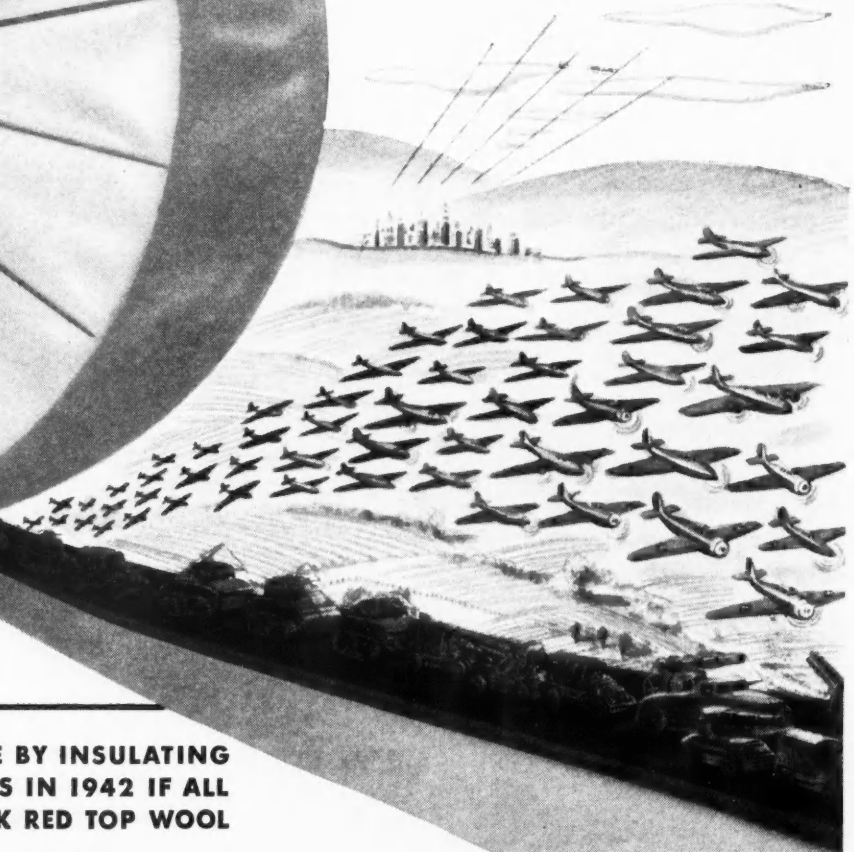


▲ 3/4 H.P. multi-speed totally enclosed 3 phase motor operating a unit heater

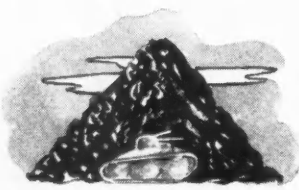
▲ 1/3 H.P. capacitor start cushion mounted motor installed in a vertical unit heater

Insulation

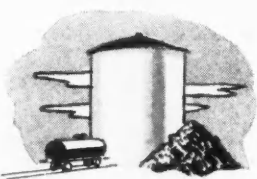
W. P. B. RULING



ESTIMATED SAVINGS POSSIBLE BY INSULATING 600,000 NEW DEFENSE HOMES IN 1942 IF ALL WERE INSULATED WITH 3" THICK RED TOP WOOL



Enough metal to build over 5,000 tanks or other vital war supplies.



Enough fuel to release over 47,000 freight cars, and millions of delivery truck miles.



Consumers savings of \$13,470,360 to buy War Bonds and Stamps.



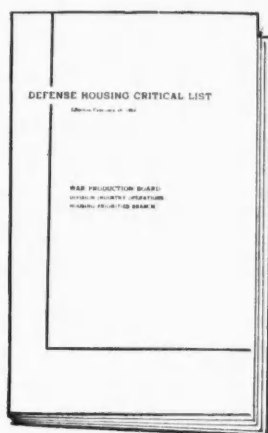
UNITED STATES GYPSUM

This famous trademark identifies products of United States Gypsum Company —where for 40 years research has developed better, safer building materials.

INSULATION • WALLBOARD • ROOFING • PAINT • LATH • PLASTER

is Vital *to meet* *W.P.B. Ruling*

MAKES INSULATION VITAL IN WAR EFFORT



To "keep 'em rolling," War Production Board regulations limit the size of heating plants for Defense Houses; also heat loss. Insulation is the logical method of meeting these requirements.

By thorough insulation, more metal is available for ammunition, tanks and jeeps. Fuel saved releases cars for busy railroads. Saves tires. Dollars saved can go into War

Bonds, virtually making ammunition with insulation... and helping our war effort.

The Government urges insulation for old houses, as well as new. Red Top Insulating Wool, "Made of Fiberglas," is a product you can go "all out" with for this work; and Red Top Wool enables you to do it because it is "Precision" made and tailored to fit buildings. Thus it assures peak insulation efficiency and heat savings.

If you are figuring Defense Housing jobs, you will want the new chart we have prepared to make it easy and quick to figure insulation and heating that will fulfill WPB requirements. Send today for your FREE copy.

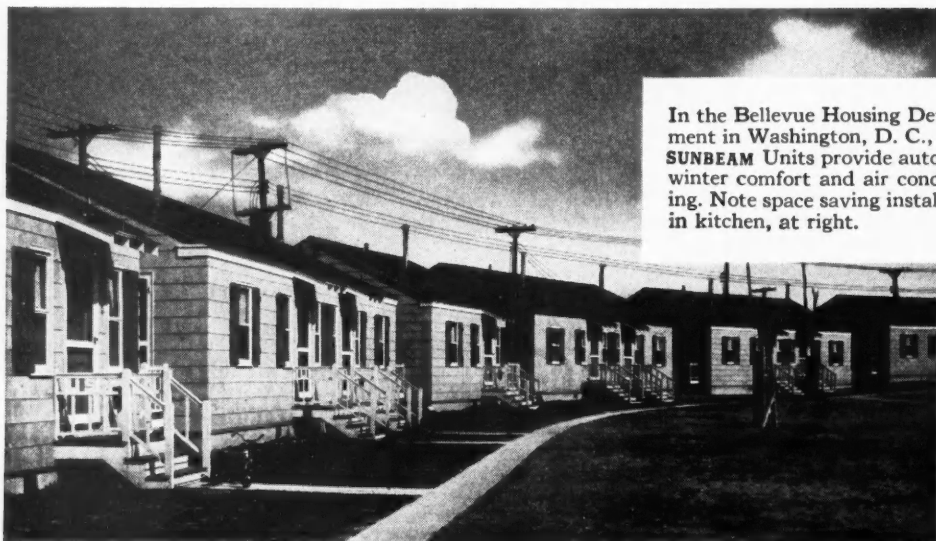


UNITED STATES GYPSUM CO.
300 W. Adams St., Chicago, Ill.
Gentlemen: Please send me your new FREE chart which makes it easy to figure heating requirements to meet WPB Defense Housing Critical List.

Name.....
Street.....
City..... State.....

SUNBEAM

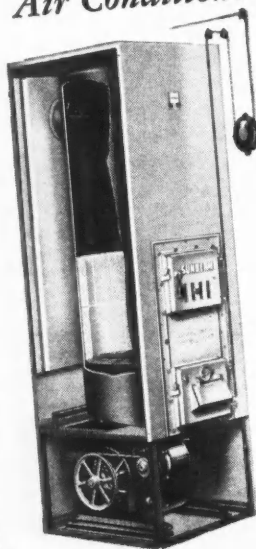
FOR WAR HOUSING



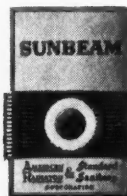
In the Bellevue Housing Development in Washington, D. C., many **SUNBEAM** Units provide automatic winter comfort and air conditioning. Note space saving installation in kitchen, at right.



THE MAUMEE a **SUNBEAM** Winter Air Conditioner for War Homes for Coal



A hand-fired coal burning unit for small homes. Blower and motor located underneath fire box, as illustrated. Air intake on either side or in rear. Jacket neatly finished in aluminum colored baked-on enamel. Unit takes only 24" x 26" of floor space. Can be installed in kitchen or other suitable space on first floor, if desired. Btu Capacity at Bonnet 69,300.



FOR War Housing, **SUNBEAM** Warm Air Furnaces and Winter Air Conditioners check on every vital specification.

There are units for every fuel and every type of home, with or without basements.

Write for folder showing **SUNBEAM** Units for War Housing—with complete data, ratings and specifications.

For modernization, Time Payments available in accordance with U. S. Government regulations.

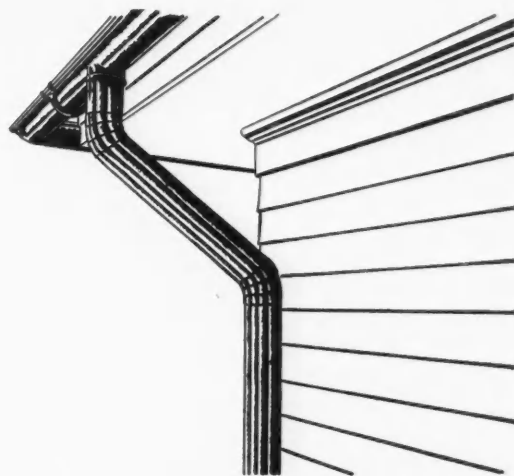
Our ability to furnish these products, as well as the products shown in our catalogue, is subject to the needs of the War Program.



AMERICAN & **Standard**
RADIATOR & **Sanitary**
New York CORPORATION Pittsburgh

★ ★ FIGHT FOR VICTORY. ENLIST NOW IN THE U. S. SERVICE ★ ★

THE COPPER THAT MIGHT
HAVE BEEN USED FOR
THIS SHEET METAL WORK



Instead— Makes huge COPPER TUBES for vital new ships



OUR COUNTRY'S war needs require all the copper that would otherwise go into regular peacetime uses . . . such as sheet metal work on residences and commercial buildings.

Typical of the applications for which copper is vitally needed is this large copper duct fabricated from sheet for use on a new cargo ship. Copper equipment of

many kinds is needed in shipbuilding, as well as in our essential chemical industries.

The time-honored properties of copper with which the sheet metal trade has so long been familiar—rust-immunity, corrosion-resistance, heat conductivity . . . and easy fabrication . . . these are some of the reasons why copper finds such great demand in our war program.

42758



Anaconda Copper

THE AMERICAN BRASS COMPANY • General Offices: Waterbury, Connecticut
Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario



Civil aviation authorities long ago ruled that no plane could be used in commercial passenger service unless it had at least *two* engines. This safety factor has greatly reduced the hazard formerly associated with air travel.

In Twin Contact Controls, normal load is divided between two contacts, but either can break the circuit should the other fail—thus assuring safe operation even in an emergency. This construction also provides better balance and freedom from "pigtail" drag.



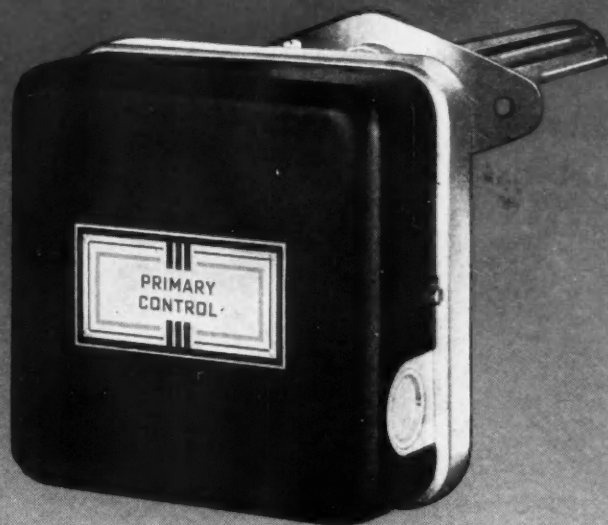


Improved Element Gives More Sensitive Control, Less Affected By Soot

The unusual stack thermal element of this Twin Contact Oil Burner Primary Control responds more actively to temperature changes than conventional elements of the bimetal type. This increased sensitivity at low stack temperatures, which prevail particularly in modern high-efficiency equipment, is most necessary. At the same time, this unique element will withstand higher stack temperatures and will be less affected by soot accumulation than other types of elements.

This control does not re-start the burner with a hot combustion chamber after flame failure. Under such conditions, shut-down demanding manual reset is the only safe course. Re-start with ignition after current failure is always assured, and timed ignition, factory calibrated (on intermittent ignition models) is an additional advantage of this control.

These features are evidence of the sound, far-sighted engineering found in all Twin Contact Controls. A complete line is available, sold only under the name of the burner with which they operate. Your burner manufacturer can tell you about Twin Contact Controls.



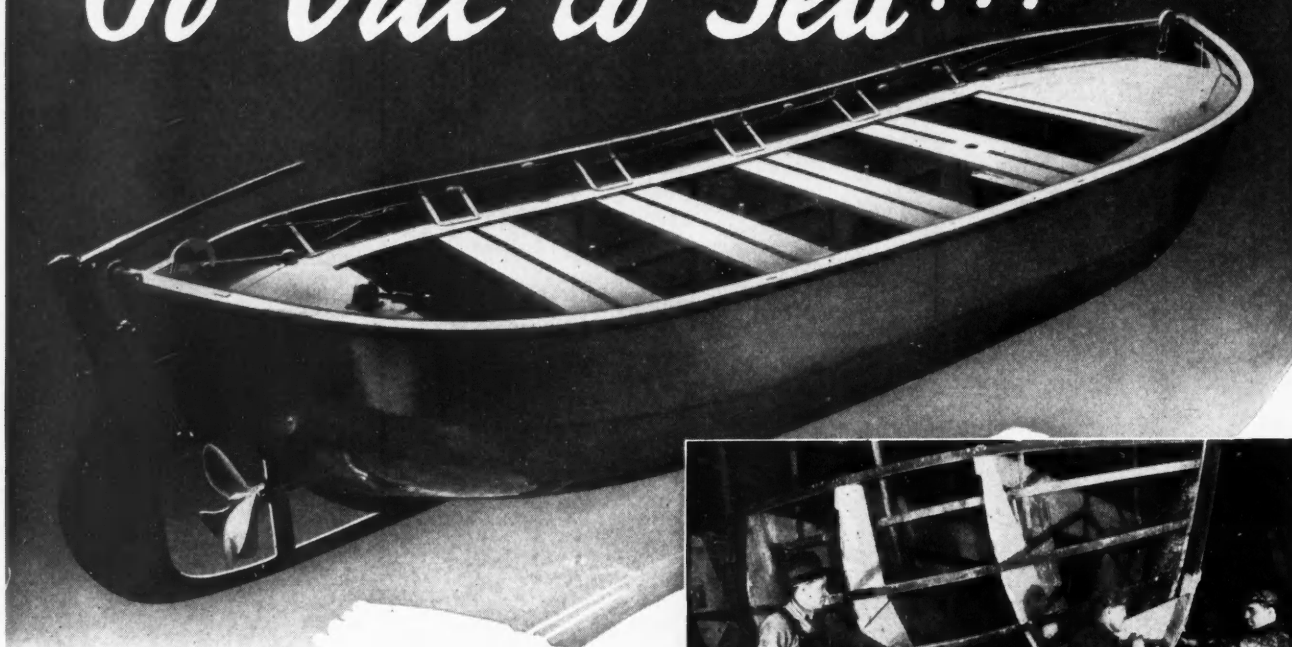
Twin Contact Controls

PERFEX CORPORATION

500 West Oklahoma Avenue, Milwaukee, Wisconsin

GOLDEN STAR SHEETS

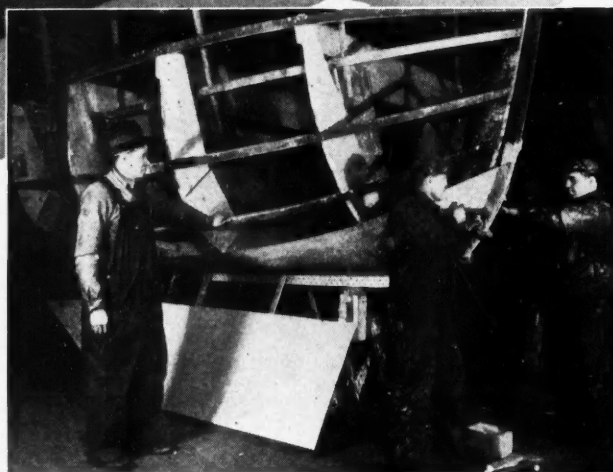
Go Out to Sea...



All of us are vitally interested in the progress of the war. We listen to our favorite radio commentators... read the newspapers... and are continually discussing the latest developments. Naturally, as we do these things, we think of the men, planes, tanks and ships involved, but seldom do we remember the countless other materials that are helping to achieve victory. Among these are Golden Star Sheets.

Ordinarily, you wouldn't think of OSBORN galvanized sheets in connection with life boats and rafts. Yet, these are but two of the many war products in which they are used today. Of course, we're proud to have them selected for such important war accessories and to know that Golden Star quality... easy workability and long life are influencing factors in their choice.

Every day, a rapidly increasing number of sheet metal shops are receiving orders for one type of

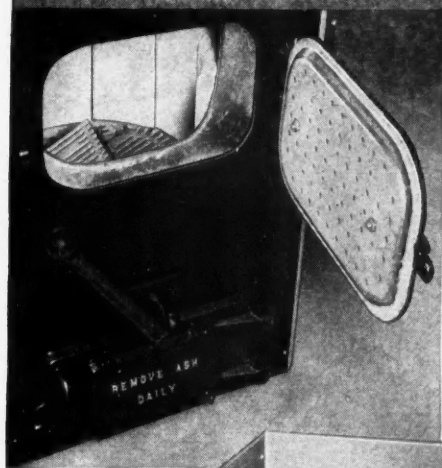


war work or another. Likewise, a higher percentage of OSBORN products are being furnished, on priorities, to supply their needs. Thus, each of us will and must do his part because final victory will be won only through our combined efforts and by the use of the unmatched production skill which we Americans possess.

THE J. M. & L. A.
OSBORN Co
 CLEVELAND, OHIO
 BUFFALO • CINCINNATI • DETROIT
 Distributors of Metals and Metal Products

A D E P E N D A B L E S O U R C E O F S U P P L Y F O R 8 3 Y E A R S

Hand-fired coal heat *for the homes of war workers*



Notice the large coal firing opening, unusually capacious for a unit this size. The easy grate operation is also shown.

FITZGIBBONS 80 FWA WARM AIR CONDITIONERS

Ready now for prompt shipment

Designed to government specifications, of course — but a Fitzgibbons unit in everything that has made the name Fitzgibbons just another word for convenient, economical comfort-heat. For instance, Fitzgibbons "Weldseal" construction — meaning the positive and permanent exclusion of dust and combustion gases from the air stream. All seams and joints are electrically welded, the Fitzgibbons way.

The blower unit is resiliently mounted, balanced both statically and dynamically for vibrationless, quiet operation. An automatic switch operated by a control in the plenum chamber, turns the blower on or off depending upon the temperature setting.

Everything pertaining to combustion is designed with the inestimable advantage of Fitzgibbons many years' experience in this field. Grey-iron grates have air spaces correct for complete burning of fuel. Firepot has a fitted pre-cast high test ceramic liner. Service and ashpit doors are large for easy service, with gasketed joints for tightness. The manually operated regulator effectively controls rate of combustion.

The unit is shipped completely assembled, except for jacket and plenum, which are quickly and easily installed.

Mail the coupon below for complete data.



AA-5

Fitzgibbons Boiler Company, Inc.
101 PARK AVENUE, NEW YORK, N. Y.

Send me the bulletin about the
Fitzgibbons 80 FWA.

Name.....

Address.....

City and State.....

PENN ELECTRIC SWITCH CO.

GOSHEN, INDIANA

INTER OFFICE CORRESPONDENCE

FROM M. E. Henning

May 1, 1942.

TO R. H. Luscombe

SUBJECT: AVAILABILITY OF PENN CONTROLS

Bob, I believe we should inform our customers that they still can depend upon PENN for full cooperation. Of course, "business as usual" is out for the duration. Wartime demand for vital materials has curbed automatic controls along with many other products. We all know that ... and we must cooperate to achieve our common goal ... victory!

Naturally, our armed forces are getting first call on our facilities. But ... we will continue to serve manufacturers, wholesalers and dealers as fully and as promptly as possible. Tell our customers that PENN CONTROLS are still available and will be shipped on priority orders.

Perhaps, shipments will not be as prompt as in the past, but we will do everything humanly possible ... under essential Government restrictions ... to provide our customers with efficient and dependable controls.

*John Hietala -
I think this tells
the story. Why not
use it for an ad?
Bob*

Mal

Have you tried Scully?

WE are not magicians, but we will do everything within our power to help you get the materials you need. We have stocks of many steels on hand, also tools, machinery and other equipment.

Be sure to try Scully — see our phone numbers below. Cut out the number of the warehouse nearest you and paste it in a handy spot.

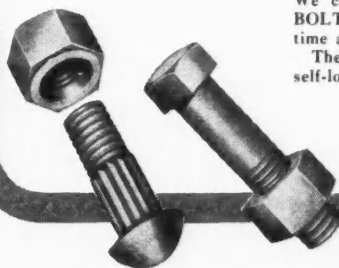


Structural material
Plates, various qualities
Floor Plates
Sheets: Hot Rolled, Cold Rolled, Galvanized, etc.
Bars (all shapes): Hot Rolled Carbon and Alloy grades
Hot Rolled Strip Steel
Spring Steel • Tool Steel
Drill Rod
Cold Finished Bars, Carbon and Alloy grades
Wire
COR-TEN and MAN-TEN Shapes, Sheets and Plates
Abrasion-Resisting Sheets and Plates
Eaves Trough, Conductor Pipe
U-S-S Stainless Steel and Stainless products
Expanded Metal
Rails
Boiler Tubes
Rivets, Bolts, Nuts, Washers
Dardelet Rivet and Machine Bolts
Nails
Welders and Welding Accessories
Chain
Clamps
Flanges
Expanders, etc.
Hoists, Shears, Rolls, Punches, Cut-Off Machines, Saws, Nibblers, etc.



CHICAGO.....	BRUnswick 2000
Teletype CG. 605	
BALTIMORE.....	GILmore 3100
Teletype BA. 63	
BOSTON.....	STAdium 9400
CLEVELAND.....	HEnderson 5750
Teletype CV. 153	
PITTSBURGH.....	CEdar 7780
Teletype PG. 475	
ST. LOUIS.....	MAin 5235
MINNEAPOLIS - ST. PAUL.....	NEstor 2821
NEWARK, N. J.....	BIgelow 3-5920
	BErgen 3-1614 - REctor 2-6560

IN STOCK! DARDELET "RIVET-BOLTS"



We can offer immediate shipment of both Dardelet "RIVET-BOLTS" and Dardelet Machine Bolts. These bolts save valuable time and labor and assure permanently tight joints.

The Dardelet "RIVET-BOLT" is a ribbed bolt with Dardelet self-locking thread, and is widely used for field erection of structural steel. Has recessed nut. Bolt is driven in and nut is applied with wrench. Economical and strong.

The Machine Bolt with Dardelet self-locking thread is for general use where vibration is present.

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel and Steel Products

Warehouses at CHICAGO • NEWARK, N. J. • ST. LOUIS • BOSTON
ST. PAUL - MINNEAPOLIS • CLEVELAND • PITTSBURGH • BALTIMORE

UNITED STATES STEEL

WHAT A LOUISIANA SHOP DID WITH ITS

WAR CONTRACT

A 90-day time limit for installing 58 tons of sheet metal in an Army cantonment calls for fast work and sound planning. The Holzer Sheet Metal Works of New Orleans found this out not long ago.

Their sub-contract took in ducts, stacks and roof-jacks for all barracks and mess halls in a nearby encampment. Holzer used galvanized ARMCO Ingot Iron for the job. He had two good reasons.

First, he knew from experience that this ductile iron would work fast and accurately on his regular equipment; that it was uniform and free from troublesome spring-back. This helped to speed shop and field work and eliminate delays.

Second, the Government wanted a durable job that would cost little for upkeep. ARMCO Ingot Iron filled the bill here because it holds the longest record of actual service of any low-cost iron or steel sheet. In-



The Holzer Sheet Metal Works in New Orleans put in 58 tons of ARMCO Ingot Iron ductwork like this in an Army camp. The uniformity and easy-working qualities of this sheet metal man's sheet metal helped the men to do a good job in quick-step time.

stallations made in 1909 are in good condition today!

Holzer did a bang-up job and kept well within his time-limit. Now he is busy on a duct contract for ships being built in a Texas ship-

yard. If you have a high-priority contract, or are planning to get one, base *your* bid on galvanized ARMCO Ingot Iron. You'll do better work faster, and this is what the boys "up front" like best to hear about the boys "back home." The American Rolling Mill Company, 1780 Curtis Street, Middletown, Ohio.



TOPS for WAR HOUSING

U.S. GRAVITY REGISTERS



U.S. No. 40 SERIES

Maximum Capacity—Minimum Grille Resistance with pleasing Non-Vision Feature. Two Piece Construction with Removable Grille (patented lug fasteners eliminate loose screws) guarantees against Air Leakage and Wall Discoloration and creates perfect distribution of warmth.

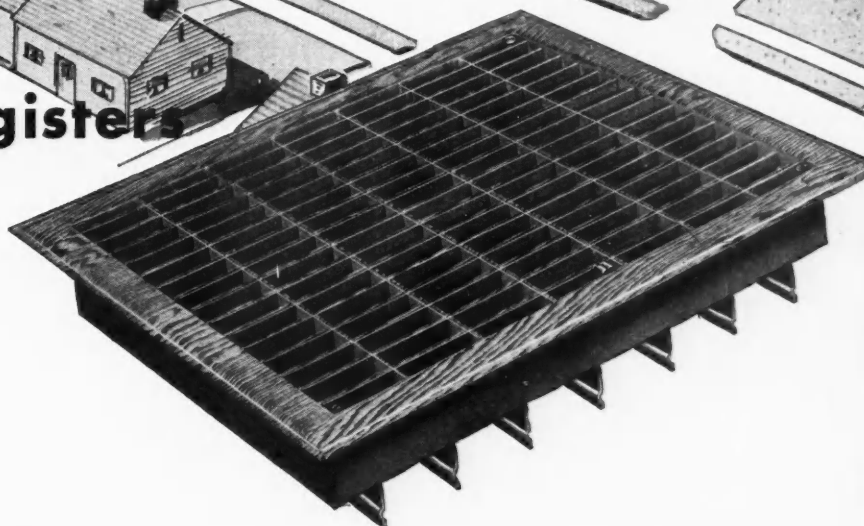
These—plus low cost and ease of Installation—are but a few of the Many Reasons Why the No. 40 U. S. Gravity Baseboard Registers are Superior for War Housing.

TRUSSTEEL Floor Registers

U. S. No. 400

Floor register specifications can be complied with none equal to No. 400 Trussteel Floor Registers. Mesh permits maximum Free Area—yet spacing of grille bars prevents entrance of heels. The new feature of short-way valves adds power to the valve mechanism — guarantees easier and more powerful operation.

Matching Cold Air Faces U. S. No. 405



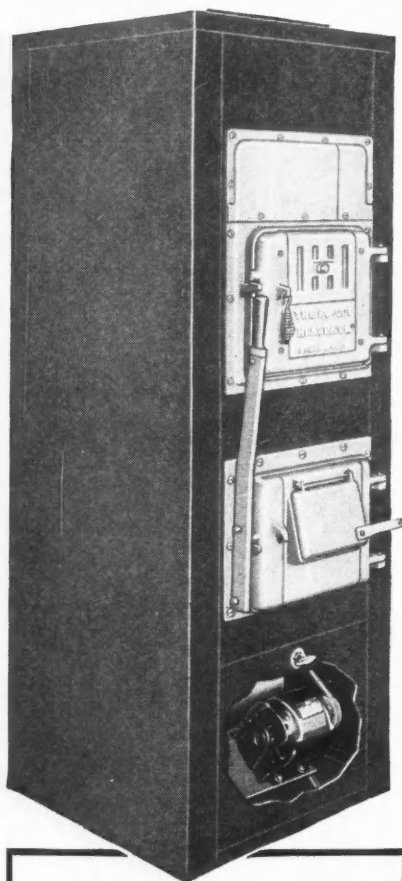
Engineers: First move—write for No. 41 G Gravity and No. 41 A. C. Air Conditioning Register and Grille Catalogs.



UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

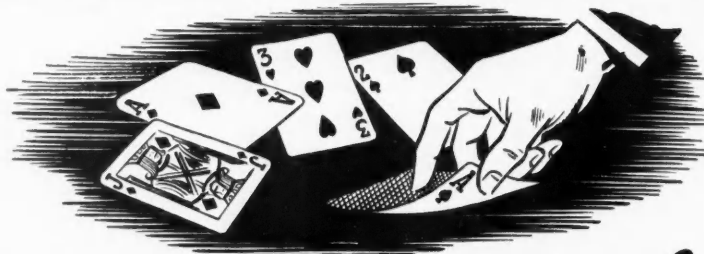
RYBOLT



RYBOLT SERIES DH-615V HI-BOY FORCED AIR UNIT

Here's a new RYBOLT heating unit that perfectly meets War Housing conditions, particularly where every inch of floor space counts. Unusually compact, takes only 26" x 26" floor space. 72" high with blower underneath heating element. Steel coal-fired heating element, welded construction. A dependable unit with ample heating capacity for the small or even medium sized house. Attractive baked enamel finish. Priced low enough to come well within War Housing cost restrictions.

Other special defense units have blower compartments which can be mounted on either side or rear of cabinet. Also investigate RYBOLT Series 1815, a special small capacity 18" gravity furnace particularly suitable for size and price limitations of War Housing.



Your ace in the hole - RYBOLT SPECIAL UNITS FOR WAR HOUSING

• Let's face the issue squarely. Heating unit sales are definitely restricted for the duration. Your only major market open today is in War Housing.

This market is by no means small, involving as it does 350,000 houses to be privately built. These houses will be small and low priced under Government restrictions. Necessarily, therefore, the heating units will be low priced, compact to fit into small space, yet they must be dependable and efficient with ample heating capacity.

The RYBOLT line includes a number of heating units specially designed to meet these exacting war-time requirements. This special RYBOLT line gives you a better than even break to get your share of this War Housing business. *It's your ace in the hole* —your best bet to keep on doing business.

P-84 for Replacements and Repair Business

Not to be sneezed at is the amount of business possible to secure by aggressive selling under P-84. Under this order the Government grants permission to get needed materials and parts for repairs or maintenance of old furnaces and heating units. Also, new units can be furnished to replace existing equipment which is beyond repair. There is a penalty, however, for using material available under this order for remodeling or modernizing existing equipment. Write us for complete information.

Write for complete details of the
RYBOLT WAR HOUSING Sales Plan



THE RYBOLT HEATER COMPANY
615 MILLER STREET * ASHLAND, OHIO



Most Regulated—But Still Fighting

IF THERE be any industry more regulated, ordered, limited, circumscribed than is our industry—we'd like to hear about it.

The scope and restriction of the orders, limitations, regulations which now tell us what we can do and how, have been growing month by month. In the brief period since the April issue of AMERICAN ARTISAN went into the mails six major orders affecting the warm air heating industry have been applied.

These are: L-63 (Jobbers inventory control); L-22 (Furnace production limitation order); L-79 (Furnace "freezing" order); L-74 (Stop oil burner production); L-75 (Domestic stoker stop production order); L-41 (Stop building order).

In addition, L-31 (gas heating order) was extended to more areas and P-110 (preference rating for remodeling projects) makes it possible for the house owner to remodel to provide additional war worker quarters, but limits our ability to provide more modern heating.

These orders, or an analysis of their pertinent sections, are presented in pages following.

These regulations which affect our industry run all through the M, P, L, orders of WPB. Many affect our operations directly; others affect us indirectly through control of materials and equipment we use.

Up to now—if we haven't overlooked a few—we are now operating under these orders—

Defense Housing Critical Materials List; M-9A (copper conservation); M-38 (lead conservation); M-18A (chromium conservation); M-21B (steel warehouse control); M-17 (pig iron control); M-67 (jobbers' inventory regulation); M-43A (tin content in solder); M-11 (zinc conservation).

P-76 (steel container material supply); P-79 (steel drum material supply); P-55 (material for construction defense housing); P-100 (materials for repairs); P-19A (materials for defense housing construction); P-19C (materials for construction of publicly financed housing); P-46 (materials for utility maintenance); P-110 (materials for house remodeling); P-90 (Production Requirement Plan); P-84 (materials for maintenance and repairs).

L-13 (restrict production of metal furniture); L-75 (restrict manufacture of domestic stokers); L-22 (furnace production limitation); L-74 (restrict manufacture of domestic oil burners); L-79 (stop furnace production); L-29 (restrict metal sign manufacture); L-41 (stop building order); L-63 (suppliers inventory control); L-31 (gas heating limitation order); L-56 (fuel oil conservation).

Even this impressive list does not tell the full story. There are other orders which regulate the manufacture of sheets, equipment, accessories, by controlling output or by compelling sales to other channels; there are still other orders which affect us by cutting off accessory items needed to manufacture equipment we ordinarily use; and still more orders which affect certain fabricators of specialty items.

And to complete the picture, the latest 90-day stop production order covering some 400 items using metal lists air conditioning systems (except hospitals), attic fans, metal ceilings, cabinets and furniture, culverts, dust collecting systems and equipment below A-1-J, enamel store fronts, gutters, conductors, downspouts, metal insulation, laundry chutes, lockers, marquees, sign frames and panels, sink drains, all kinds of tanks, tool boxes and window ventilators. Maybe we missed a few items in the long list.

It would be easy to sit down and say—"What's the use of trying to stay open?"

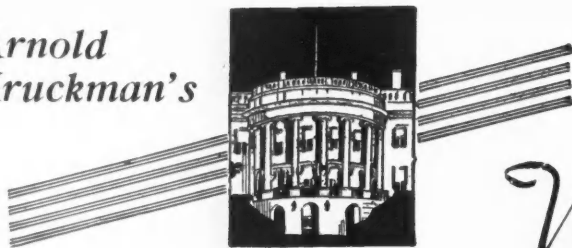
Probably the fellow who scares easily, who refuses to think, who lets himself be whipped in the first round, who says, "there's too much red tape for my stomach"—will quit.

But we won't all quit. Most of us will pitch in and work like hell to find things to do to keep our shops open. For that "never-say-die" individual we here repeat once again the possibilities as we see them.

1—The field looks wide open to furnace repair business. Only a limitation of pig iron and steel will prevent us from keeping every furnace in working condition. This market is almost big enough to keep us all fairly busy.

2—There should be opportunity for replace-

(Continued on page 106)



The New National Housing Agency

WE now have a National Housing Agency. It is important to understand about this new Federal unit because it is the over-all controlling influence that will dominate practically all home building for the next few years. It came into existence with so little fuss that even here in the Capital we have learned about it only gradually, in bits and pieces. This is so extraordinary in recent experience with this Government that many of us wonder if perhaps we in Washington may be the only group not informed. You out there in the wide expanses of the country may know all about it. As things go now, we often hear some of the most important news when it comes back to us from outside.

Social Planning Spotlighted

The National Housing Agency was created by fiat, through an Executive Order, issued on February 24, 1942. The Order placed all 16 housing financing and construction agencies under the new National Housing Agency. You will recall that previously the Federal Public Housing Administration had been created with John H. Blandford, Jr., a somewhat radical social planner, at its head. The appearance of the FPHA and Blandford, marked the disappearance of Housing Coordinator Palmer who was sent on a tour of Britain. Blandford came from the public ownership fastnesses of Los Angeles and Cincinnati, via the President's Bureau of the Budget. On the way he had spent several years putting more social planning in the TVA.

It really is to the point to understand all this because it will help you to follow the development of the NHA as it may unfold its plans in the future. Blandford, a disciple of the school of Clarence Dykstra, is not rabid or fuzzy, but he is thorough in his business-like adaptation of social planning philosophies. He is an absolute, clean-cut, clear-headed social planner who gives a sane twist to socialization rationalizing. He has had considerable experience in professionally managing cities, and he appears to be a sound business man, under social planning limitations.

Three New Divisions

When the National Housing Agency came into existence this is what happened: they grouped the 16 lumped agencies into three divisions. The Federal Public Housing Administration was placed in charge of all construction of housing paid for directly by public funds. It was given authority to amalgamate, actually to amalgamate, agencies like USHA, Defense

Housing, Urban Housing, housing built by Federal Public Works, and all housing built by or for Army and Navy off Army and Navy reservations. Army and Navy still is responsible for all housing on or within the reservations, and, incidentally, spend far more money on each dwelling in those reservations than is spent on housing by FPHA per unit.

It is important to bear in mind that the present desire in Government is to forget there ever has been an USHA, or a Defense Housing, or Urban Housing, or any of the other numerous housing enterprises by Government that bloomed so luxuriantly for a while all over the United States. Today it is earnestly proposed that FPHA shall be impressed into the consciousness of Americans as *the* sole construction agency for housing built by tax money. Herbert Emerich, another warm New Dealer, who came up through the Bureau of the Budget, is the Federal Public Housing Administrator, *under* Mr. Blandford. In the light of these personalities it is easy to understand why the Capital feels the emphasis in the housing program has swung from purely utilitarian requirements to social purposes.

Regional Offices Will Do Business

FPHA has, or will have, ten regional offices. Those now in existence are Region 1, at 24 School Street, Boston; Region 2, 270 Broadway, New York City; Region 3, Temporary Building 2, 19th and D Streets, Washington, D. C.; Region 4, Georgia Savings Bank Building, Atlanta, Ga.; Region 5, 201 North Wells Street, Chicago; Region 6, Electric Building, Ft. Worth, Tex.; Region 7, Humboldt Bank Building, San Francisco; Detroit Office, otherwise unassigned, Barlum Tower Building.

Region 1 consists of New England; Region 2, New York, Pennsylvania, New Jersey; Region 3, Maryland, Delaware, District of Columbia, Virginia, West Virginia, Kentucky; Region 4, Tennessee, North and South Carolina, Georgia, Florida, Alabama; Region 6, Louisiana, Mississippi, Arkansas, Oklahoma, Texas, New Mexico; Region 7, Arizona, California, Nevada, Utah, Idaho, Oregon, Washington. Region 5 now covers an area that apparently is still to be divided into three parts. As present-constituted Region 5 embraces Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota, Montana, Wyoming, and Colorado.

This list is important to you because at the regional offices you will find the people you must see in

order to get business in connection with the proposed housing to be built by the Government in the War areas. It now appears probable you will have to do considerable of your business at these regional offices even if contracts sometimes are made with the local groups placed in charge of the building by FPHA. The idea is to decentralize the responsibility as far down as possible. Local groups with local architects and engineers are expected to take over under the very general direction of FPHA, and the local groups are expected to build, with Federal funds, permanent housing—so far as possible—that will reflect local likes and habits, and they are expected to spend the funds locally for materials, for services, for equipment, for everything that may be secured in the local area.

FPHA Will Decide Priorities

Keep an eye out for announcements about sub-offices of the regional FPFA offices. There will be many sub-offices. They will have a hand in site planning, selection, design, and management. Specifications will be found at FPFA offices, and the FPFA people will be able to determine whether the job will be done by competitive bids or by negotiated contract.

Bear in mind also that FPFA, through NHA, will largely determine the priority rating you will get to carry out your part of the job. This FPFA connection is fundamentally important for the contractor, the subcontractor, the supplier, for any manufacturer or service man who want some of this housing business. Obviously, the priority rating will make or break your opportunity. This rating will be determined naturally by the recommendations which the FPFA people make to the NHA superiors; and the speed with which the priority is issued, as well as the rating of the priority, will depend upon the steam the NHA people put behind their negotiations with the WPB. There will also be NHA regional offices in the field. We do not yet know where they will be located. But it is reasonable to assume they will roughly parallel the location of the main regional FPFA offices. You will have to do your business with the FPFA people on this public housing, and it is never wisdom or tact to go over one Government agency to another that is its senior. Yet, it often is possible to make acquaintances legitimately in the agency above without giving offense anywhere. Such acquaintance, under these circumstances, will be helpful to every person concerned.

FHA Continues As Before

We have been discussing one major group for which in effect the NHA is the holding company. This is the character and purposes of the other two: the Federal Housing Administration retains its previous name and general character and Abner Ferguson continues as its head; the other, the Federal Home Owners Bank continues the general functions of the Home Owners Loan Corporation and takes in the Farm Security Administration and operates more particularly for rural needs and for the service of those who invest in the construction of the lowest cost dwellings.

Both of these agencies differ wholly from the FPFA in the fact that they are Federal *finance* instrumentalities. Their function is to help citizens, individually or in business groups, to secure funds to build dwellings or housing facilities in War areas. The Federal Housing Administration continues as the agency that insures loans made to private persons or firms from

private sources.

By the time this is published it seems likely HR 6927, which has already passed the House, will be law. This prospective legislation provides another \$500,000,000 for War housing insurance. Single-family dwellings, costing \$6,000, are to be insured for \$5,400; two-family dwellings may be insured for \$7,500; three-family, \$9,500; four-family, \$12,000. The mortgages would mature in 25 years. There are also liberalizing conditions for arranging financing; and amendments to Title VI enables FHA to insure large-scale War housing rental projects up to \$5,000,000, and to make advances during construction. A project may be insured up to 90% of the appraised value of the completed project, with a limit of \$1,350 per room.

The FHOB, still headed by John H. Fay, carries on the general banking functions which have become familiar in the operations of the HOLC. These divisions of NHA either insure loans for private use, or make loans to private sources for the specific purpose of constructing War housing.

May Be 600 Defense Areas

Obviously this housing, private or public, may be built only in the War areas, ultimately expected to number about 600. Housing to be built by private operators with Government credit starts initially at the nearest FHA office.

After the plans have met the approval of the FHA people in the nearest local office they submit the approved schedule to the NHA. From NHA the approved application for priority ratings go to WPB. The intimation is that NHA will very naturally battle for any priority ratings it recommends.

There are indications that the business of securing priorities even for War housing will not be smooth sailing. Sullivan Jones, the lawyer, who wrote the building curb Order L-41, is the chief of the WPB Housing Priorities Branch. Jones apparently has been thoroughly impressed with the sharply growing demand for iron, steel and all critical materials. He recently said that War housing, to be considered, should be within a mile of a War plant, and would not be considered if it is over two miles away from the center of activities.

How Much War Housing?

The whole program of prospective War housing is still confused. There is a responsible official group in Washington which sincerely feels even more than 350,000 dwelling units must be provided. They mention as many as 600,000 units. This would mean Government must build at least another 150,000 units with public funds. Roughly this would put approximately \$2,000,000,000 Government funds in War housing. Up to this writing about \$1,400,000,000 has been actually spent or is committed.

But there is a far more numerous group of WPB officials who strenuously demand that the program for building houses for War workers be sharply restricted. They are so important that they have forced the issue before the WPB Requirements Committee. This is the WPB body which functions directly under Donald Nelson to reconcile demands of different phases of War activities without conflict. This Committee in March tentatively approved an allocation of material for 300,000 War dwellings. It is this allocation which is under reconsideration. The decision is expected not later than early in June.

This situation has been created by the demands
(Continued on page 94)

Defense Developments

Furnace Advisory Committee

THE Bureau of Industry Advisory Committees today announced the formation of the Warm Air Furnace Subcommittee of the Plumbing and Heating Industry Advisory Committee.

W. W. Timmis is Government Presiding Officer.

Committee members are:

H. S. Sharp, Vice Pres.
Henry Furnace & Foundry Co.
Cleveland, Ohio.
Cliff Ackerson, Vice Pres.
Agricola Furnace Company
Gadsden, Alabama
W. L. McGrath, Vice Pres.
Williamson Heater Company
Cincinnati, Ohio
L. R. Taylor, Vice Pres.
International Heater Company
Utica, New York
Frank C. Packer
Payne Furnace and Supply Company
Beverly Hills, California
A. W. Wrieden
Lennox Furnace Company
Syracuse, New York
R. S. McNanney, Pres.
Dowagiac Steel Furnace
Dowagiac, Michigan
F. H. Faust
General Electric Company
Bloomfield, New Jersey
Robin Bell
Surface Combustion Company
Toledo, Ohio

More No-Gas Areas

RESTRICTIONS on the delivery of natural and mixed natural and manufactured gas to consumers, as provided in order L-31 issued February 16, 1942, have been extended to parts of six midwestern states.

After May 15 no utility may deliver natural or mixed gas for the operation of a gas heating system unless such equipment was installed prior to May 15 or unless, in the case of new construction, the gas-heating equipment was specified in the contract and the foundation under the main part of the structure in which the equipment is to be installed was completed prior to May 15. The prohibition also applies to gas heating equipment which has been converted from other fuel to natural or mixed gas unless conversion takes place prior to May 15.

The new areas brought under the restrictions are:

IOWA—The western part of the state, including Des Moines, Sioux City and Fort Dodge, served by Northern Natural Gas Co. and utilities obtaining any part of their requirements from that company.

KANSAS—Central Kansas, including Wichita and Hutchinson, served by Cities Service Gas Co., Kansas Power & Light Co., Kansas-Nebraska Gas Co., Con-

solidated Gas Utilities Corporation, Drillers' Gas Co., and utilities obtaining any part of their requirements from those companies. The areas in Kansas formerly brought under the order remain under the restrictions.

MINNESOTA—Minneapolis and the area in the southern part of the state served by Northern Natural Gas Co. and distributing utilities.

NEBRASKA—Omaha, Lincoln and other areas in the eastern and central parts of the state served by the Northern Natural Gas Co., Kansas-Nebraska Gas Co., Cities Service Gas Co., and utilities obtaining any part of their requirements from those companies.

OKLAHOMA—Certain areas throughout the state, served by Cities Service Gas Co., Consolidated Gas Utilities Corporation, and utilities obtaining any part of their requirements from those companies.

SOUTH DAKOTA—Sioux Falls, Yankton, Vermillion, and other areas served by Northern Natural Gas Co. and utilities obtaining any part of their requirements from this company.

These extensions of the areas affected are embodied in Amendment No. 2 to Exhibit A, Limitation Order L-31.

War Contracting By Negotiation

CHAIRMAN DONALD M. NELSON of the War Production Board signed on March 4 a directive to insure the widest possible placement of war supply contracts and a much greater utilization of small plants and factories.

The directive has these provisions:

1. Effective at once, all military supply contracts are to be placed by negotiation instead of by competitive bidding, unless the Director of Purchases, WPB, specifically authorizes the use of competitive bids.

This provision is expected to result in speedier procurement and in broader use of the Nation's productive capacity.

2. In placing contracts, primary emphasis is to be put upon speed of delivery.

This provision is frankly designed to shift the emphasis away from price and put it upon speed.

3. Contracts for standard and semi-standard articles relatively simple to make shall be placed with smaller concerns, so that the facilities of the larger, more fully equipped firms may remain available for production of more difficult and complicated items.

4. Subject to these considerations, contracts are to be placed with concerns which need the smallest quantities of new machinery and equipment.

If You're Stuck in a \$6,000 House

PRIOR to the issuance of L-41 (stop building order) and L-79 (furnace freezing order) there were many houses costing over \$6,000 under construction or about to start. It is possible that over-zealous WPB-FHA offices may try to stop completion of these

buildings on the strength of, we quote from L-41—"Although the order applies only to construction not yet commenced, projects already under construction are being carefully examined by WPB on an individual basis. Such projects may be stopped if the scarce materials to be used in them can be put to more effective use in the war program."

Should you have a furnace or sheet metal or roofing involved in such a stop order suggest to the owner that he make application for a priority on Form PD-1A. With the application be sure you, as the contractor, give all information on the equipment you are installing. Be sure to state if the building is in a defense area; if it's in a non-defense area see if the owner is directly or indirectly connected with war work and if he is explain fully in a letter. Washington seems to want to help war workers, farmers, men connected with food production or distribution so make a case for your owner.

If the local board refuses to change its attitude you can make an appeal to an appointed appeals board or to Plumbing and Heating Branch, WPB, Washington.

Gas Furnace Stocks

AS of March 1, the National Warm Air Heating & Air Conditioning Ass'n estimates that there is in industry stocks \$1,750,000 of gas furnaces held by manufacturers and \$750,000 of gas furnaces in jobbers' and dealers' stocks. Total \$2,500,000.

Plumbing and Heating Branch of WPB has promised that every effort will be made to assist in disposing of these stocks. At present, however nothing has been done.

It seems to the editors that so far as the dealers and jobbers are concerned dealers may sell to other dealers or back to jobbers or manufacturers without violating L-79 the "furnace freezing order" and that jobbers can sell to other jobbers or back to the manufacturers also—providing, of course, a buyer can be found. The manufacturer, seemingly, can sell only to jobbers and dealers in areas still open for gas.

Incidentally we have not heard of any of the "exemptions" we thought would be made by this time.

Along this line "Gene" Spraker, Secretary of the Michigan Sheet Metal, Roofing, Heating and A. C. Association writes:

"I have been trying to get Michigan's WPB to ease up on L-31 so that our members could sell their frozen gas furnaces. We have gotten nowhere. The Michigan Public Service Commission has ruled that, due to a possible gas shortage in the future, no new gas customers may be taken on after March 31. This seems to stop any easing up of L-31.

"It would seem that Michigan dealers will either have to sell back to the manufacturer or else we will have to find buyers in areas where gas can still be sold."

Revision to PD-25A, PD-25X

COMPANIES operating under the Production Requirements Plan are now permitted to use ratings assigned by other certificates to obtain material not regularly carried in stock.

Originally, no company operating under the Production Requirements Plan was permitted to use preference ratings assigned in any other way, except for capital items, without a special authorization.

The amendment permits a company operating under the Production Requirements Plan to extend ratings on orders received for "as required" or "special order" materials not ordinarily carried in stock without the necessity of filing special supplementary application on the appeals form, PD-25F. However, any company which uses ratings under this amendment must report such use to the Production Requirements Branch at the end of each month.

Small Remodeling Jobs Granted 5-A Preference

WPB moved April 10 to make it easier for owners to remodel housing that can provide additional living accommodations essential to the war program.

In order P-110, effective immediately, and A-5 preference rating is assigned to deliveries to builders and their subcontractors of materials entering into low cost remodeling projects in areas important to the war effort.

It is limited to projects for which the cost of materials which are on the Defense Housing Critical List does not exceed an average of \$100 per room for each dwelling unit. The scarce materials for each structure cannot cost more than \$800.

Projects must be located in Defense Housing Critical Areas and the material for which a rating is granted is limited to that specified on the Defense Housing Critical List. Owners are not permitted to sell or rent any dwelling unit included in the project at prices higher than those approved on the application. In any case the monthly rental—less certain service charges—cannot exceed \$50 for each dwelling unit and the sales price cannot exceed \$6,000 for each single family accommodation.

Builders may apply for rating on Form PD-406 which should be filed in the local office of the Federal Housing Administration. Copies of PD-406 soon will be available at any local office of the FHA, at any priority office of the Bureau of Field Operations of WPB, or at banks, building and loan associations, or other housing institutions. Information regarding the Defense Housing Critical Areas List and the Defense Housing Critical List may be obtained at any local office of the FHA.

Remodeling projects rated under P-110 are exempt from the provision of Conservation Order L-41, issued April 9, 1942, which restricts construction. Order P-110 is published on following pages.

Change to Coal If Possible

HOME owners in Atlantic Coast States, and in Washington and Oregon have been warned to change back from oil to coal heating.

Transfer of some tankers to war service and loss of some others through enemy action caused the War Production Board to issue a curtailment order through the Office of Petroleum Coordinator on March 14 limiting consumption of fuel oil used for industrial

(Continued on page 99)

L-79 (*New Furnace Freezing Order*)

THE drastic limiting order L-79 which froze all stocks of new heating equipment and accessories in the hands of dealers, jobbers, manufacturers on April 16 is not, exactly, what its "freezing" nature implies.

This order, above all others released to date, demands careful study and analysis.

First of all, L-79 cannot be completely divorced from L-41 the "stop building" order.

The purpose of L-41 is to stop all construction which is not essential to the war effort. L-79, is, in effect, the supplementing and implementing order which makes L-41 effective so far as the heating industry is concerned. Keep this in mind.

The purpose of L-79, Washington says, is to prevent the sale of heating equipment for non-war building, unnecessary replacements or for modernization which does not provide war workers quarters.

Everyone knows that prior to L-41 and L-79 non-war houses were being built all over the country—houses costing above \$6,000; houses not in defense areas; and that betterment was going on where replacement or repair could suffice. L-41 and L-79 stops this.

L-79 should be studied along with L-41 which we print in this issue. L-79 should be thoroughly studied and completely understood because it sounds worse than it actually is. There are exceptions to L-79 and these exceptions reduce the stringency of the order. These exceptions provide considerable leeway for the industry.

Therefore, to assist in interpreting the order, we

emphasize the exceptions which make it possible for the dealer to continue to operate. These exceptions are:

1—Any order or project bearing an A-10 or better rating can be filled or contracted.

Note 1: Since all private or public defense housing bears an A-10 or better you can continue to sell new furnaces for these new defense houses.

Note 2: Since all repair and replacement work if above \$50 gets an A-10 rating if approved, you can continue to do repair work.

Note 3: Since structures important to the war effort or essential civilian needs (P-19-h) and remodeling of houses for war workers' quarters (P-110) will get an A-10 or better rating, you can continue this work.

2—You can continue to sell or deliver items which sell for no more than \$5.00 without any preference rating or certificate.

3—You can sell and deliver any used equipment.

4—If you are a dealer you can sell to any other dealer or to a jobber or to a manufacturer of heating equipment.

Note: This is a means whereby you can sell your gas furnaces or blowers or equipment which is now dead back to the jobber or manufacturer.

5—Jobbers, likewise, can sell to other jobbers or back to the manufacturer.

L-41 (*The Stop Building Order*)

FOR months the entire building industry has been hearing rumors of a blanket "stop building" order. On April 9 the order L-41 was issued, effective immediately.

The order is drastic; it will hurt certain operations, but as we have pointed out time and again, the order does not materially change the basic picture which was set months ago. Only those who refused to study previous orders which indicated trends will be surprised.

The order does not effect construction of houses for defense workers as specified.

The order does not stop building in defense areas.

The order permits maintenance and repair and small remodeling.

What the order does do is to stop all "non-essential" building; meaning—houses costing over \$6,000; houses in non-defense areas; factory, store, commercial structures in non-defense areas or not directly engaged in war production.

Specifically, heating contractors can continue to:

1—Install furnaces or parts as repairs and replacements.

2—Install furnaces in buildings which were above the foundation on April 9.

3—Install furnaces in defense areas in defense houses.

4—Install furnaces in houses burned down since January 1 because such an owner is permitted to rebuild. But he must obtain authorization to build.

5—Do sheet metal work on remodeling or alteration on houses where the total cost of the remodeling is less than \$500; apply sheet metal or roofing on farm buildings (not farm houses) where the total cost of the proposed work is under \$1,000; do sheet metal work on commercial or industrial buildings where the total cost of the project is under \$5,000.

For all the above three types of project the owner does not have to obtain authorization nor priority assistance.

The restrictions of L-41 apply to all inventories—stocks in dealers', jobbers', contractors' hands and inventory may not be used except as explained above. L-41 goes farther than SPAB'S Defense Housing Rating Plan announced last October in that last year's plan denied priority assistance to all non-defense construction—L-41 rules no construction may be started unless expressly authorized by WPB.

L-41 is equally binding on property owners, builders, suppliers, contractors—jobbers, manufacturers,

contractors may not deliver from their stocks materials or equipment unless authorization is made by WPB.

The contractor can ascertain if the job is authorized by asking to see the preference rating order issued by WPB. This authorization will be on one of the P-series forms: P-19-g or P-19-d for publicly financed housing; P-19-h or P-19-i for buildings important to the war effort or essential civilian other than housing; P-55 or P-55-amended for privately financed defense housing; P-110 for remodeling of housing in defense areas.

Preference ratings extended on PD-1 or PD-1A forms do not constitute authorization to begin construction. (Manufacturers and jobbers note this).

If your customer wants to apply for permission to build and *requires priority assistance* (furnace, sheets) apply on the proper preference rating order or certificate as listed in the second preceding paragraph above.

If your customer *does not require priorities assistance* (roofing, insulation) apply for specific authorization to "Begin Construction" by filing forms PD-200

or PD-200A—together with a statement showing—that no priorities assistance is needed; 2—whether any previous priorities application has been denied; 3—the total value of all construction involved. File forms with FHA.

Questions and Answers

Here are some interpretations applying to our industry:

Q. The site has been staked off, building permit issued, equipment delivered and paid for. OK?

A. No. Construction is "begun" only when equipment has been incorporated in the building itself.

Q. Foundation of house laid last winter. Work stopped during winter. Can owner, without authorization, complete house?

A. Yes. And furnace can be installed as specified.

Q. Owner has received FHA loan to build but was not started before April 9. Does this authorize completion?

A. No. Authorization must be obtained just as in a new house.

L-63 (Suppliers Inventory Control)

ONE important question under L-63 is—Is the furnace dealer a "dealer" as specified in the order? The Chicago office of WPB says—"If the furnace dealer buys his furnaces *direct from the manufacturer* he is a "dealer". "If he buys his furnaces *from a jobber* he is *not* a "dealer".

The dealer who buys his furnaces *from the manufacturer* must limit his inventory to "twice the dollar value of sales of specified types of supplies which were sold in the second preceding calendar month (eastern and central time zone) and three times the second preceding month in other time zones. He must also keep records of sales on Form PD-336 for two years.

The dealer who buys his furnaces *from a jobber* does not need to keep any record and does not qualify under L-63.

Sheets fabricated for ducts are not "supplies" therefore no record need be kept of sheet consumption under L-63.

All products which are *not changed in form passing through the shop* are "supplies" and must therefore be recorded.

But remember! "Suppliers" or (dealers) whose total inventory at cost is less than \$20,000 and less than \$10,000 for any one of the listed types of supplies, are exempt from the terms of L-63.

INVENTORIES of 19 kinds of supplies, whether in the hands of wholesalers, distributors, jobbers, dealers, retailers, or branch warehouses are strictly limited by Suppliers' Inventory Limitation Order L-63, issued April 6.

Wholesalers and dealers affected by the order who are located in the eastern and central time zones are required to limit their inventories to twice the dollar value of sales of the specified types of supplies which they shipped from stock in the second preceding calendar month. Suppliers located in other time zones may have inventories equal to three times the corresponding amount.

Shipments made directly from producers to customers in which the distributor acts only as an agent may not be included as a basis for calculating permissible inventory.

Suppliers whose total inventory at cost is less than \$20,000, and less than \$10,000 for any one of the listed types of supplies, are exempt from the terms of the order. Special provision is also made for inventories of seasonal supplies.

The order supersedes Suppliers' Order M-67, cover-

ing plumbing, heating and electrical supplies, which is revoked.

The types of supplies in our industry covered by Order L-63 are as follows:

Builders' Supplies
Construction Supplies
Electrical Supplies
Hardware Supplies
Plumbing and Heating
Supplies
Refrigeration Supplies
Welding and Cutting
Supplies

Suppliers affected by the order are required to keep records of their inventory and sales on Form PD-336, and to keep this form in their files for at least two years.

Separate records must be kept for each type of supplies handled by the distributor or dealer.

Suppliers affected by the new order whose inventories on hand at the time the order was issued exceed the permissible maximum, must not receive any deliveries of such supplies until the inventories are

reduced below the maximum. However, when inventories are below maximum, suppliers may receive deliveries of minimum commercially procurable quantities, even though such deliveries would raise their inventories above the maximum.

Important section of the order follow:

Suppliers' Inventory Limitation Order L-63

1046.3 Suppliers' Inventory Limitations Order L-63

(a) Definitions:

- (1) "Supplies" means all the supplies including appliances, normally carried in stock for sale by suppliers.
- (2) "Supplier" means any person (other than a Producer) whose business consists, in whole or in part, of the sale from stock or inventory of Supplies. "Supplier" includes wholesalers, distributors, jobbers, dealers, retailers, branch warehouses of producers and other persons performing a similar function.
- (3) "Producer" means any person including any branch, division or section of any enterprise, which manufactures, processes, fabricates, assembles or otherwise physically changes any material.
- (4) "Sales" means sales from stock including consigned stocks and excluding direct shipments.
- (5) "Seasonal Lines" means any line of Supplies in which a minimum of 40% of the Supplier's total annual sales of that line are made during a period of 90 days, or less.

(b) Limitation of Suppliers' Inventories:

- (1) Except as provided in paragraphs (b) (3), (4), (5), and (6), no Supplier shall accept any delivery of Supplies from any person which will effect an increase in inventory of supplies in the hands of the Supplier above the Supplier's Maximum Permissible Inventory; and
- (2) Except as provided in paragraphs (b) (3), (4), (5) and (6), no person shall make to any Supplier

any delivery of Supplies which such person knows or has reason to believe will effect an increase in such Supplier's inventory of Supplies above the Supplier's Maximum Permissible Inventory.

- (3) The Supplier in any Time Zone shall be permitted to purchase and store an amount of Seasonal Lines equal to those which he purchased in the peak period of a comparable period of the previous year, but this peak season shall not exceed ninety days.
- (4) A Supplier may accept delivery of Supplies which will increase his stock above the Maximum Permissible Inventory, if such Supplier's inventory of Supplies is at the time of delivery less than his Maximum Permissible Inventory and the delivery is of the minimum quantity of such Supplies that can be commercially procured.
- (5) The provisions of this Order shall not apply to any Supplier:
 - (i) whose total inventory at cost, including consigned stocks, of all supplies is less than \$20,000.00, and
 - (ii) whose total inventory at cost of each type of supplies as set forth in paragraph (a) (1) of this Order, is less than \$10,000.00.

(e) Records and Reports:

- (1) Each Supplier (other than those Suppliers who are exempt from the provisions of this Order pursuant to Paragraphs (b) (5) or (6) shall, on or before the twentieth day of each month make proper entry of inventory (Book or Physical at cost), sales of direct shipments, sales, from stock, and total sales of each type of Supplies as set forth in paragraph (a) (1) of this Order, during the previous calendar month on Form PD-336. This form must be retained for a period of at least two years for inspection by representatives of the War Production Board.
- (2) The Director of Industry Operations may at any time call for these reports to be submitted to the War Production Board.

L-22 (Furnace Manufacture Limiting Order)

AS predicted in the April issue the War Production Board has ordered a reduction in the amounts of iron and steel which may be consumed in the manufacture of warm-air furnaces.

The Order (L-22) was effective on April 11, and covers all warm-air furnaces designed to heat the interior of a building, *except those commonly known as space heaters or floor furnaces.*

The terms of the order limit Class A manufacturers (over 8,000 furnaces in 1940) to the use during 1942 of 50 percent of the iron and steel consumed in 1940. Smaller manufacturers, Class B, (those who made or assembled less than 8,000 furnaces in 1940) are required to reduce iron and steel consumption 10 percent.

It is estimated by the WPB Plumbing and Heating Branch that the regulations will result in the saving of approximately 100,000 tons of iron and steel, and reduce the consumption of the industry to about 200,000 tons. This is the amount of iron and steel calculated to be needed for the manufacture of furnaces for military, war time housing and essential civilian replacement purposes.

If we assume that 80,000 Btu capacity will be the largest furnace made; that this furnace with casing weighs approximately 800 pounds; we have 200,000

tons (400,000,000 pounds) divided by 800 makes possible production of 500,000 furnaces.

But the defense housing program calls for only 320,000 new furnaces of the PBA-18 type (800 pounds). This will require 128,000 tons and leaves 72,000 tons for replacement furnaces. At 1,000 pounds per furnace, 144,000 replacement furnaces are possible.

Officials believe the restrictions will mean a 50 percent cut in the production of furnaces available for civilian replacements. If furnace users take proper care of existing equipment, it is believed, there will be an ample supply of new furnaces for the minimum civilian requirements.

The curtailment is expected to speed the conversion of the larger manufacturers to the production of urgently needed war goods. Difficult problems, however, are expected to arise in the conversion of smaller manufacturers whose facilities are not readily adaptable to uses other than those for which they were originally designed.

The order affects about 200 companies, of which about 20 accounted for 60 percent of the industry's production in 1940. Since the smaller manufacturers are faced with only a small reduction in the use of iron and steel, no serious labor displacement problems are anticipated as a result of the order.

L-74, L-75 (Oil Burner-Stoker Stop Order)

WAR Production Board on April 15 ordered an end to the manufacture of oil burners and coal stokers for residential use after May 31, and limited the production of commercial and industrial types to orders bearing a preference rating of A-10 or better.

These actions were embodied in Limitation Orders L-74 (oil burners) and L-75 (coal stokers).

According to officials of the Plumbing and Heating Branch, the stoker order will result in the saving of about 80,000 tons of iron and steel, and 142,000 sets of the controls and small horsepower motors. Similarly, the oil burner order will save 12,000 tons of iron and steel, and material for 211,000 sets of controls and motors.

Order L-74 defines a "Class A oil burner" as any which has a capacity for burning oil at a rate in excess of 15 gallons per hour. A "Class B oil burner" is any with a lesser maximum capacity.

Order L-75 defines a "Class A coal stoker" as any which has a capacity for feeding coal at a rate in excess of 60 pounds per hour. A "Class B coal stoker" is any with a lesser maximum capacity.

The terms of both orders establish these limitations:

1. Beginning April 15, no person shall produce, fabricate, or assemble any Class A oil burner or coal stoker except to fill an order with an A-10 or higher rating.
2. For the period April 1 to May 31, fabrication or assembly of Class B oil burners or stokers must not exceed 1/12 of the production of these types during 1941.
3. After May 31, 1942, no person shall produce, fabricate, or assemble any Class B oil burner or coal stoker.

The manufacture of replacement parts for all types of burners and stokers is specifically permitted by two orders.

Officials state that manufacturers have inventories of approximately 35,000 coal stokers and about 60,000 oil burners. It is expected that an additional 30,000 stokers will be fabricated before May 31, while about 60,000 additional oil burners are now in the process of fabrication.

Production of coal stokers in 1941 amounted to approximately 200,000 units, compared with 150,000 units in 1940. Oil burner production totalled 320,000 units in 1941, against 265,000 units during the previous year.

P-110 (Material for Remodeling in Defense Areas)

IN Order P-110, effective immediately, an A-5 preference rating is assigned to deliveries to builders and their subcontractors of materials entering into low cost remodeling projects in defense areas.

It is limited to projects for which the cost of materials which are on the Defense Housing Critical List does not exceed an average of \$100 per room for each dwelling unit. The scarce materials for each structure cannot cost more than \$800.

Builders may apply for rating on Form PD-406 which should be filed in the local office of the Federal Housing Administration.

Following are important sections of the order:

PREFERENCE RATING ORDER No. P-110

(a) DEFINITIONS.

(2) "Subcontractor" means any person with whom the Builder has placed a contract pursuant to which the Subcontractor has agreed to furnish both labor on, and Defense Housing Material to be incorporated in, the Remodeling Project.

(4) "Application" means the Builder's application on Form PD-406 No. as finally approved. In order to obtain the preference rating assigned hereunder, such Application must be submitted in triplicate to the local office of the Federal Housing Administration having jurisdiction over the locality in which the Remodeling Project is located.

(Note—Copies of Form PD-406 and the Defense Housing Critical List may be obtained from any local office of the Federal Housing Administration,

from any priority office of the Bureau of Field Operations of the War Production Board, the Housing Branch of the Division of Industry Operations, War Production Board, Washington, D. C., or from banks, buildings and loan associations, or other home financing institutions. Information regarding the Defense Housing Critical Areas List may be obtained from any local office of the Federal Housing Administration.)

(b) CONDITIONS OF APPROVAL. This Order has been issued upon the following conditions and understandings, and the rating hereby assigned shall be void unless all of them are met:

- (i) the project is located in a Defense Housing Critical Area;
- (ii) the project will provide more housing accommodations than existed prior to the initiation of the project;
- (iii) the project will not require for its completion Defense Housing Material having a cost for each additional housing accommodation included in the project, in excess of \$100 times the number of rooms in such accommodation, and under no circumstances, in excess of \$800 per structure. Only living, dining and sleeping rooms, bathrooms and kitchens are to be counted. Each such room will be counted as one room and kitchenettes and dinettes as one-half room each.

(c) ASSIGNMENT OF PREFERENCE RATING. Preference Rating A-5 is hereby assigned.

(2) to deliveries to a Subcontractor of Defense Housing Material which will be delivered to the Builder under the rating hereby assigned or will be physically incorporated into Defense Housing Material which will be so delivered or which will be used, within the limitation of paragraph (E) (2) hereof, to replace in such Subcontractor's inventory Defense Housing Material so delivered; (3) to deliveries to a Supplier of Defense Housing Material, which will ultimately be delivered to the Builder under the rating hereby assigned or which will be physically incorporated into Defense Housing Material to be so delivered, or which will be used, within the limitations of paragraph (E) (2) hereof, to replace in such Supplier's inventory Defense Housing Material so delivered.

(2) *Restrictions on Subcontractor and Supplier.*

(ii) Any Subcontractor or Supplier entitled to apply the preference rating hereby assigned to purchase orders or contracts to be placed by him for Defense Housing Material may defer the application of such rating until he can place a purchase order or contract for the minimum quantity procurable on his customary terms, provided that he shall not defer the application of any rating for more than three months after he becomes entitled to apply it;

(iii) A Supplier may only apply the preference rating hereby assigned to deliveries of Defense Housing Material which he will resell without substantial change in form to fill a

specific purchase order or contract rated hereunder or which he will use within the limitations of this paragraph (E) (2) to replace in his inventory Defense Housing Material so resold.

(f) **APPLICATION OF PREFERENCE RATING.**

(1) The Builder or any Subcontractor or Supplier, in order to apply the preference rating assigned to deliveries of Material to him, must endorse on each purchase order or contract rated hereunder a statement in the following form manually signed by an official duly authorized for such purpose:

"Preference Rating A-5 is applied hereto under Preference Rating Order No. P-110, with the terms of which Order the undersigned is familiar.

.....
Name of Builder, Subcontractor
or Supplier

By
Duly Authorized Official"

(2) The Builder and any Subcontractor (not a Supplier) must, in addition to the requirements of (F) (1) above, serve a copy of this Order, together with a complete and accurate list showing the Defense Housing Materials approved on the Application, to each person with whom he places a purchase order or contract rated hereunder. After one such copy has been furnished to a particular Subcontractor or Supplier, no additional copy need be furnished to that Subcontractor or Supplier to cover any subsequent application of the preference rating assigned hereunder.

Cannon Stoves in Barracks

ON March 19, the National Warm Air Heating and Air Conditioning Ass'n wrote to the United States Engineering Corps in Washington as follows:

"We understand that in a new construction program covering Theatre of Operations 15,000-men camps, you plan to use Cannon Stoves for heating men-barracks and other buildings.

"The warm air heating industry in the first World War furnished many thousands of barracks heaters for Army camp buildings and about 15,000 barracks heaters for C. C. C. Camps. Barracks heaters are furnaces made of cast iron or steel heating elements and are mounted on legs and furnished without casings and without fronts. They can be furnished in sizes of from 18 inches with capacity at the bonnet of approximately 60,000 Btu's, up to 34 inches with a capacity at the bonnet of approximately 200,000 Btu's. The most popular size which was used during the World War and also for the C. C. C. Camps were in the 26-inch size in cast iron and 27-inch in steel.

"We believe that there would be many advantages in the use of barracks heaters for the Theatre of Operations Camp buildings as follows:

1. Ample heat can be furnished because of large range of capacities to select from in barracks heaters.
2. In many cases one barracks heater will do the work of two, three, or four Cannon stoves.
3. Less operating attention.
4. Longer firing period.

5. Barracks heaters are ruggedly constructed and give excellent performance and service under severe operating conditions.

6. There is ample capacity in the warm air furnace industry to supply any demands which might be made for barracks heaters.

"We ask your consideration of a program including the use of barracks heaters for heating buildings in Theatre of Operations Triangular Camps and that the engineers representing a number of manufacturers in our industry be given an opportunity to consult with you regarding a Barracks Heater Program."

On April 4 a letter was received from the War Department as follows:

"Your letter under date of March 19, 1942, having reference to the method of heating the Theatre of Operations Buildings, is acknowledged.

"The use of Cannon Stoves in connection with these buildings is entirely satisfactory to this office. The Program is well advanced and a large quantity of stoves has already been procured.

"You are informed that changing the Program at this time in order to utilize another type of stove is not favorably considered.

For the Chief of Engineers:

Very respectfully,

/S/ Robert B. Field, Major,
Corps of Engineers, Assistant;

Engineering Branch, Construction Div."

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING

S E C T I O N



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Air Borne **DESTRUCTION** *can come in Industry, too*



"DUST STORMS" in Industry, like the tragic Dust Bowl disaster of 1938, can cause incalculable losses—destroying materials, finished products and man hours of work. But dust, the air-borne saboteur, is *one industrial menace* we can *effectively fight* within our war production plants.

Today, American Industry, geared to produce as never before, is fully awake to the necessity for *adequate dust control*. Many hundreds of existing and converted plants—and practically all new defense plants—have installed

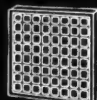
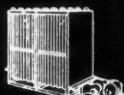
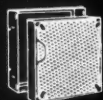
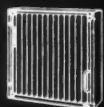
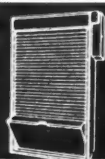
American Air Filters for the elimination of atmospheric dust and AAF Roto-Clone for process dust control.

To meet Industry's expanding need for clean air, the American Air Filter Company—largest producer of air filtration and dust control equipment—is now operating 16 to 24 hours a day—and is supplying practically 100% of its output to war materials manufacturers. If you have a dust problem, write for booklet "AAF in Industry," which tells the story of industrial dust problems and their solution with American Air Filter equipment . . . there is no obligation.

AMERICAN AIR FILTER COMPANY, INC. INCORPORATED

355 Central Ave., Louisville, Ky.

In Canada: Darling Bros., Ltd., Montreal, P. Q.



Suggested Changes and Interpretations For the Defense Housing Critical List

IN the Defense Housing Critical List (published in the March issue) there are several questions on points not completely clear to the warm air heating industry. Following are some interpretations which, so far as we know, have not been officially accepted but which probably will be acceptable.

These interpretations were suggested by the Research Advisory and Codes committees of the National Warm Air Heating and Air Conditioning Association:

Section 510. General

Objectives are to:

1. specify adequate capacity, but not excess capacity.
2. limit top size of heating unit to *delivery* of 80,000 B.t.u. per hr.,
3. demand insulation and protection of house.

Section 511.

The "Register Delivery" of the furnace shall not exceed:

- a. (66) (dwelling area in sq. ft.), or
 - b. 80,000 B.t.u. per hr., whichever is smaller.
- Note that the term "net hourly output capacity" refers to the "register delivery" and not to "bonnet output."

Section 512.

The short exact method of calculating heat losses from dwellings that is presented in the new Gravity Manual of the Association is equivalent to the "Guide method."

The heat loss calculations are to be made by the heating contractor and will be checked by the F.H.A.

Section 513.

Dwelling area is the area contained within the exterior walls. Hence a one-story building 20 ft. by 30 ft. will have a dwelling area of 600 sq. ft.

Section 514.

We have requested of government authorities that in coal-fired furnaces, the range of specified firing rates should be from a minimum of 5.0 to a maximum of 7.5-lb. of coal per sq. ft. of grate per hour. We have pointed out that our test data shows that for combustion rates less than 7.5-lb., the efficiency is higher than at the 7.5-lb. rate. Hence, the standard code rating would give the *maximum* rating, while the *minimum* rating would be equal to:

5

— times the maximum rating.

7.5

For example, if a given furnace has a Standard Code Rating of 600 sq. in. of leader pipe, then the manufacturer would be permitted to state the range of ratings as:

600 sq. in. maximum

400 sq. in. minimum

The furnace being applicable to all requirements

between 400 to 600 sq. in. No test would be required. Only a Standard Code rating is necessary.

Section 5154.—Coal fired—Gravity Furnaces

We recommend that catalogues show the following information.

- a. Furnace No.
- b. Furnace size.
- c. Standard Code rating in sq. in. of leader pipe.
- d. B.t.u. rating determined from:
(Leader area sq. in.) (136) (1.10).

This value is the *maximum* net hourly output capacity. The 110% value is a compromise value that partly offsets the "factor of safety" of 13.4% that is incorporated in the Code rating formula. (See "Winter Air Conditioning," page 442.)

- e. Minimum rating is equal to 2/3 (Item d).
- f. A note to the effect that the furnace is acceptable for all output capacities between the values shown in items (d) and (e).

Section 5154.—Gas and Oil-fired Gravity Furnaces.

We recommend that catalogues show the following information:

- a. Furnace No.
- b. Bonnet capacity, in B.t.u. per hr.
 1. Maximum Bonnet capacity
 2. Minimum Bonnet capacity
- c. Net hourly output capacity
 1. 175% (Maximum bonnet capacity)
 2. 75% (Minimum bonnet capacity)
- d. Same note as preceding note (f) for coal-fired furnaces.

Section 5155.—Forced Air—Coal-fired

We have asked that this section be revised to read: "Hand or mechanically-fired coal furnace equipped with centrifugal fan—100% of the manufacturer's certified rating of register delivery, as determined by the "Technical Code" of the National Warm Air Heating and Air Conditioning Association." The value of "180" now in the list is not correct.

This "maximum net hourly output capacity" =
 $0.85 (G \times 0.65 \times 12,000 \times 7.5) [1 \text{ plus } 0.02 (R-20)]$

The "minimum net hourly output capacity" should be 2/3 of the maximum.

Section 5155.—Forced Air—Gas and Oil

The 85% value is to allow for a 15% heat loss between bonnet and register.

General Notes

- a. Rating for coal-fired furnaces are according to:
 1. Gravity Standard Code
 2. Technical Code (4th Edition).

Ratings which have been certified by the Association will be accepted as complying with requirements. Manufacturers interested in such certification should write to the Association office for details.

(Continued on page 100)

Ducts and Fittings of "Substitute Boards"

A Study of Acceptable Practice

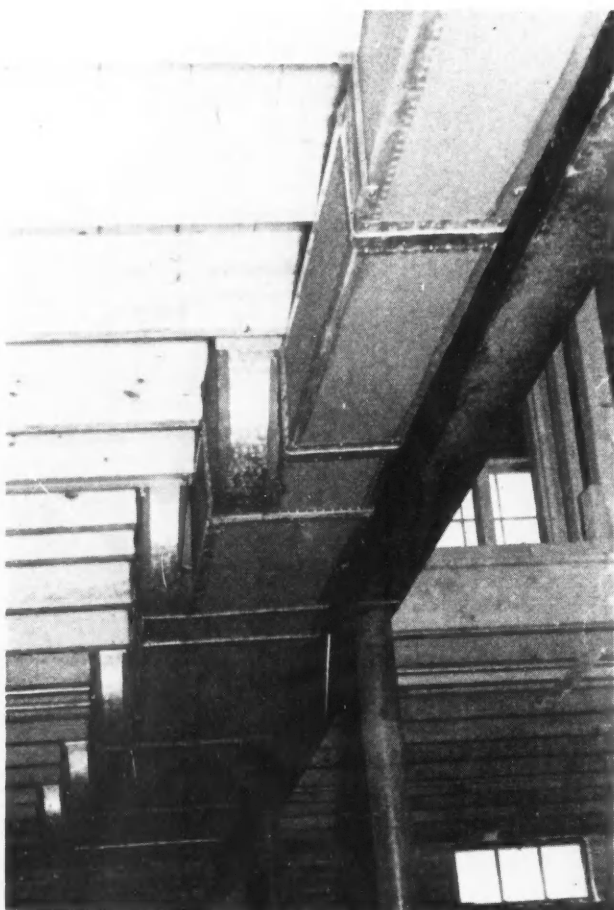
THE Defense Housing Critical List, effective February 24, 1942 states, Section 500—Heating, Sub-section 5322 Limitations of Warm Air Distribution Systems—"The following are not eligible; sheet metal double ducts, sheet metal return ducts beyond 6 feet from the heater, sheet metal heavier than 26 U. S. gauge."

This ruling by WPB has focused the attention of the warm air heating industry on ways and

means of using non-metallic boards for construction of return air lines. It has also lead to investigation of substitute board warm air ducts.

This article is a brief survey of some current practices in the construction of warm air and cold air lines with non-metallic materials. Not all of the ingenious ideas so far developed are presented, but the application methods shown, with variations, probably cover most of the basic principles now employed.

Ducts and Fittings of A. R. A. Sheets



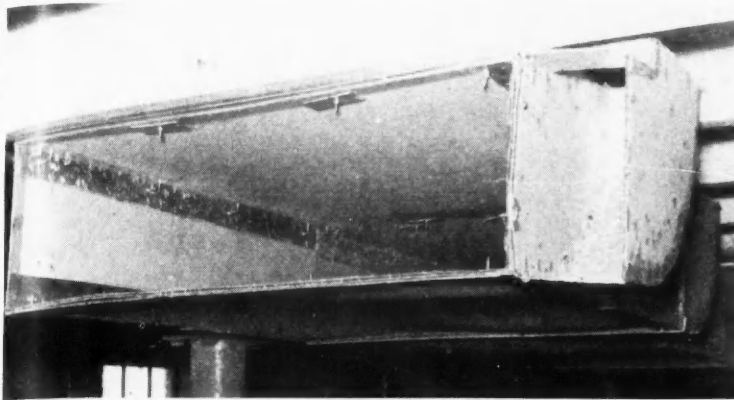
A STUDY of the possibilities of using accepted substitute board for galvanized iron was photographed in a house in suburban Chicago where A.R.A. board (Grant Wilson, Inc.) was fabricated into a trunk line warm air supply by the Dell Corp., Morton Grove, Ill.

In this installation the furnace stands at one end of the basement and a straight-out trunk is carried along the center beam with up-turned elbows supplying branches running between joists. The branches can be either round, galvanized iron, or square galvanized or substitute board constructed like the trunk.

The first sections of the trunk off the plenum are built of four pieces of A.R.A. board held together at the corners with a continuous inside and outside corner strip as shown in one photograph. Sheet metal screws through both strips and the board hold the corners together.

Sections of the trunk farther out where the

A.R.A. sheet and metal warm air supply duct constructed by the Dell Corp. using critical metal only as corner reinforcing, section cleats, elbow faces, and hangers. Branches can be metal or combination sheet and metal.



Wide ducts use continuous metal corners both inside and outside to obtain stiffness. Cross connection is a continuous metal strip outside and scrap washers inside. Elbows are held to ducts by screws and washers. Note elbow flange "ears."

size is smaller are put together with a continuous outside strip and small shop made galvanized iron washers on the inside to take the screw.

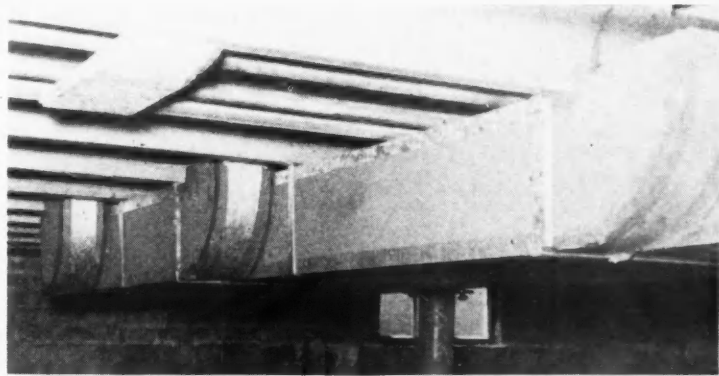
Sections are joined together by a continuous outside strip across the duct and scrap washers in the inside to take the screws (see photograph).

The duct is hung by folded strips nailed to the joist and turned under the bottom and screwed to the corner strip.

As each branch comes off the main, the main reduces in width by the width of the elbow. The elbow is made as a complete section and is fastened to the duct alongside by sheet metal screws through two washers—one inside the elbow, the other inside the duct. The outside curve of the elbow is further screwed to the main through a washer inside the elbow and the corner strip of the main.

No paper stripping was applied over the metal corner strips.

The interesting section of this duct is the elbow which Dell constructed as two A. R. A. sheet cheeks and a galvanized iron inside and outside strip. The metal strip was flanged and then



Since the board has only limited self stiffening, it is advisable to make sections short in order to obtain stiffness from frequent metal cross strips and drive cleats.

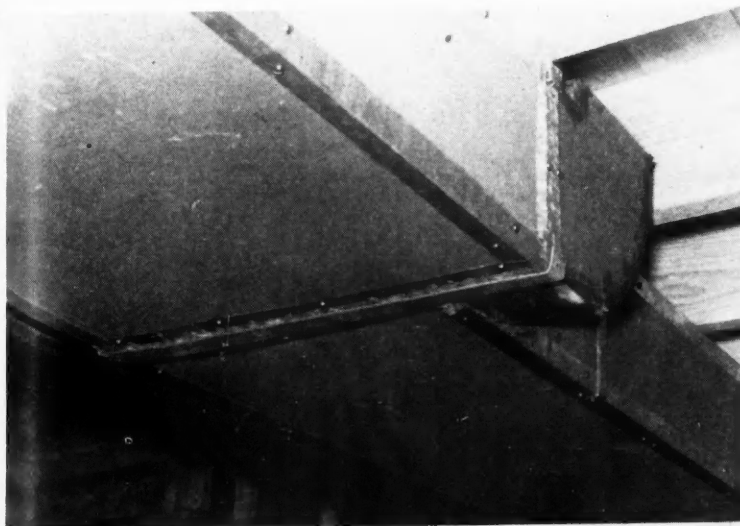
"ears" were snipped along the flange. One ear was bent in; the next ear was bent out and the board cheek was forced between the alternate ears and then the ears were squeezed against the board. About three screws along the flange keeps board and metal together. Then to seal all holes at the base of the flange the outside was stripped as shown in the photographs.

The elbow which turns between joists from the trunk below can be built of board and iron as described above and the two elbows put together before erection, or the second elbow can be built of galvanized iron if the branch is metal. If board is used, this elbow would be a duplicate of the trunk elbow except for size.

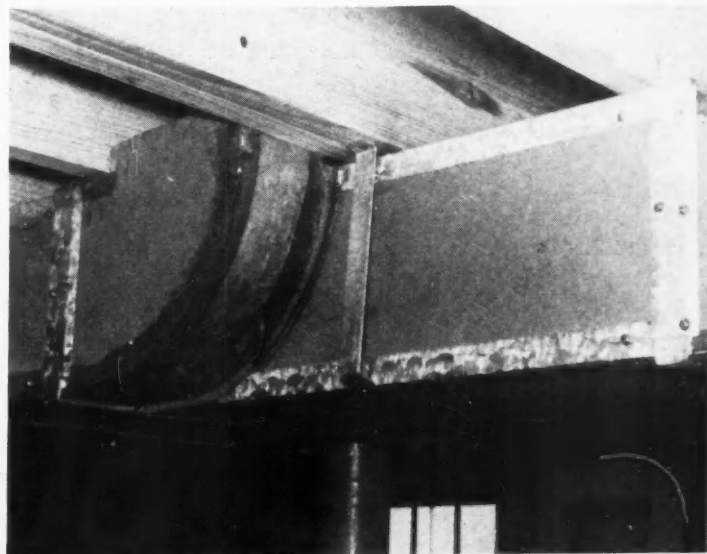
Shop Construction

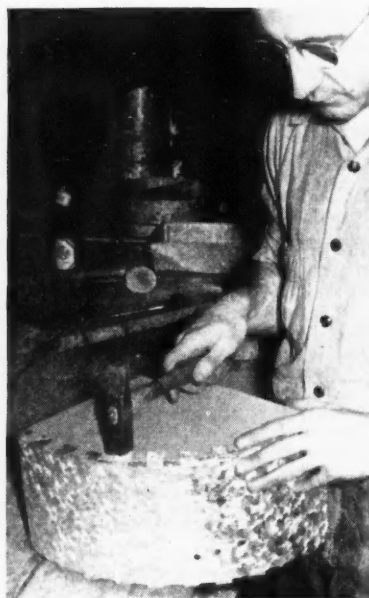
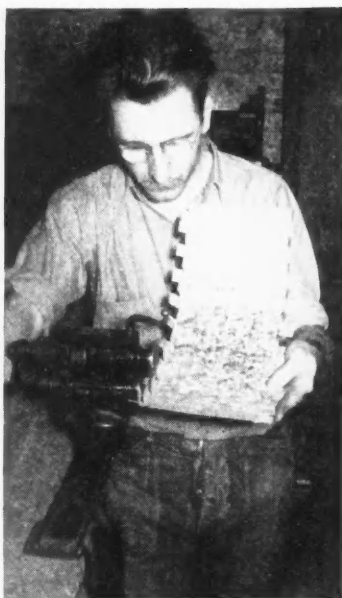
In order to study best methods of fabricating elbows as described above, mechanics in the sheet metal shop of Chicago Furnace Supply Co. cooperated in preparing a step-by-step pictorial construction study.

An elbow similar to those of the Dell Corp.



Back and front views of the metal-faced elbow. The "eared" flange has a paper strip to seal the small holes where board and metal strip meet at the bottom of the flange. Cross joints are made by screwing a strip to the board edge and connecting adjoining strips with the usual drive cleat.





Left—The flange is serrated with the snips and one tooth is bent up, the next down, the next up and so forth—with the pliers. Center—To get a loose bend at the base of the teeth (to provide space for the board thickness) the serrated edge is put through the flanger. Right—The board is inserted and the metal face bent to the contour. Then the teeth are hammered tight against the board cheek.

was selected because the construction going into the making of this elbow can be used with little variation for any transition, turn or register box of a simplified duct.

Two elbows were built—one using the galvanized iron outside face with an A. R. A. board inside face and cheeks; the other having no galvanized iron except the small washers cut from scrap. A comparison of the two resulting elbows can be obtained from the photographs.

As indicated by timing, the elbow with the galvanized iron outside face is quicker to build, easier to assemble, a little stiffer, requires no tape—but the all-board elbow is surprisingly stiff, could be cut and assembled quickly if a fixture was made up to hold the cheek to the face while screwing the pieces together and, after stripping the corners, should be completely acceptable. The all-board elbow will not stand much rough handling for once the screws are pulled all tension is lost unless another screw is run in another spot.

Using a standard 6 by 8-inch elbow cheek pattern the A. R. A. board cheeks were cut with snips. Two identical required. Then the girth of

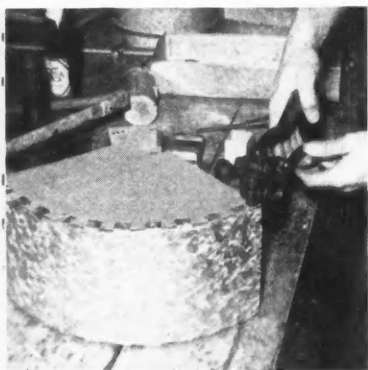
the galvanized face strip was cut and the width increased enough for two 1-inch flanges. The strip was then run through the rolls and the edger to make a score along the base of the 1-inch flange. Then the flange was snipped into a series of flat-topped ears leaving V's along the top.

The purpose of the ears is to hold the cheeks—alternate ears being outside or inside the cheek. The ears were bent in or out by hand and the cheek inserted. Then the ears were hammered against the cheek and three screws were put through the ears, the board and the scrap washers. To insert the screws, the ear and board were button punched.

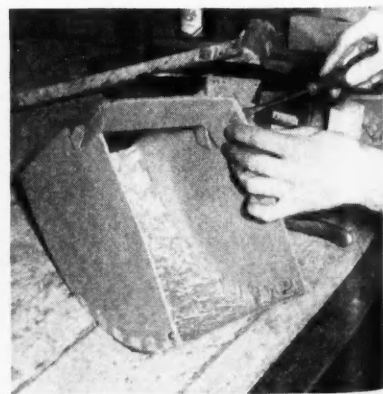
The top face of the elbow was made of A. R. A. board cut 6 inches wide plus two 1-inch flanges and then bent at right angles to give a square inside corner. The flanges were held to the cheeks with three screws.

All-Board Elbow

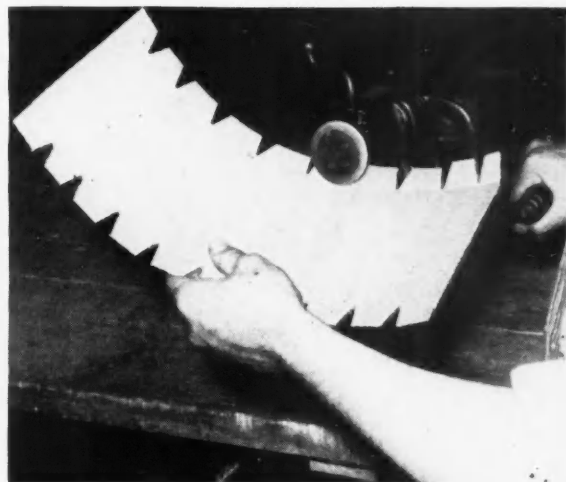
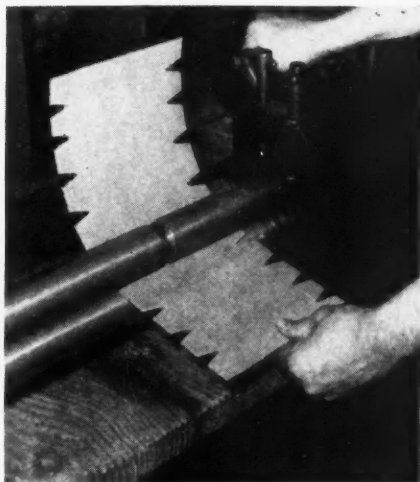
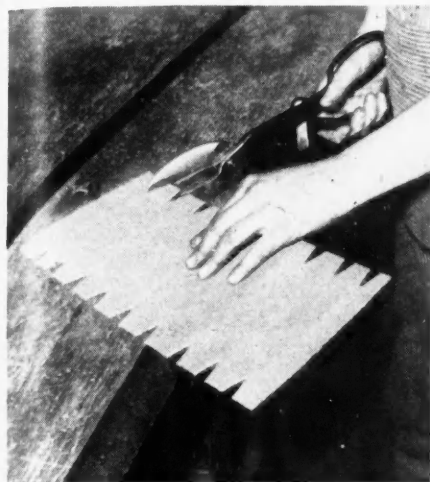
A duplicate elbow was made with all board cutting the cheeks from the standard template and cutting the outside face similarly to the metal



Left—A button punch makes a hole through ear and board for a metal screw. Right—A small scrap washer is put inside to give the screw something to hold to. Two end screws hold the elbow nicely.



Left—The right-angled inside corner is bent in the folder just like metal. Right—Properly tabbed with 1-inch flanges the corner is screwed to the cheek at three points on each side. Washers are needed on the inside only.



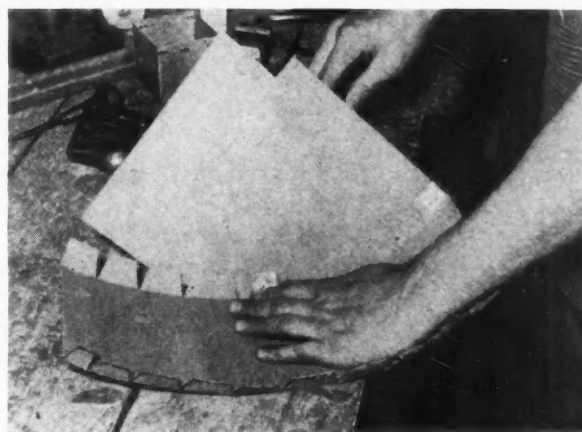
The "all-board" elbow was made like the metal and board. The face was cut to girth and the edges serrated in 1-inch "ears." Then the face was rolled to approximate contour. The board is stiff enough to hold the contour, but the surface does not break. Right—The ears must be bent up sharply so two or three passes through the edger cuts enough crease to make bending smooth yet stiff.

face. The flange was scored and flat topped ears cut as before; then the face was passed through the rolls to form the radius. The board is stiff enough to hold the radius and for elbows of this size no breaks in the surface of the board need be expected.

To hold the cheek to the board face, three metal screws with scrap washers inside were tried, but three screws were not enough to make a tight joint so four screws at the quarter points were used. After the cheek was screwed to the face the joint was taped with asbestos stripping and paste.

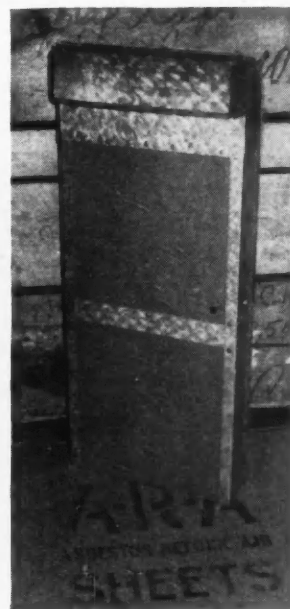
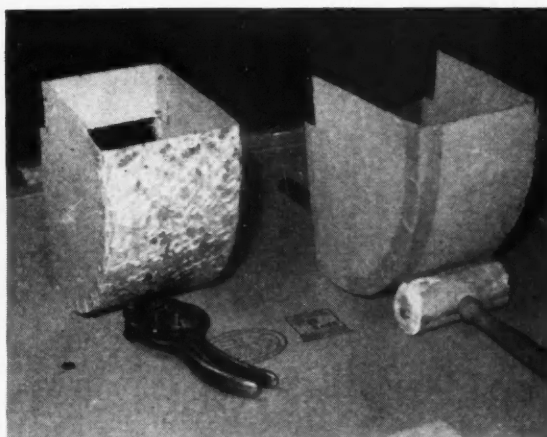
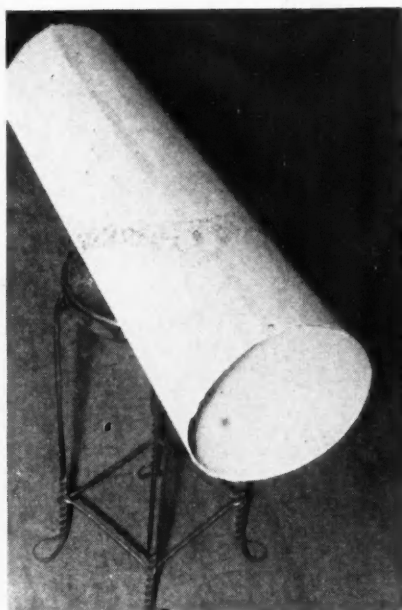
The inside face was made as before.

As stated, this all-board elbow took a little more time to assemble due to the care required to keep the pieces in alignment, but this could be speeded by a simple fixture to hold the face in contour while the cheek was screwed in place.



Assembly of "all-board" elbow. Pre-cut cheeks being metal screwed to serrated face. Four screws along the edge were found necessary to get a tight seam.

Left—A.R.A. sheet can be rolled into round pipe but it takes several passes and small diameters are likely to show sharp creases. Screws and washers hold the lap. Center—The metal-and-board and the all-board elbows. Corners of the all-board elbow must be stripped to seal small holes. Right—Sample of duct made up for submittal to housing agencies.



Between-Joist Returns, Stacks, Boxes of "Sheetrock"

(Eugene Voita, Architect—Photographs by Hedrich-Blessing Studio)

UNITED States Gypsum Company in a Research House in Park Ridge, Illinois, saved much sheet metal and added a modern return air system to the old existing piping by substituting Sheetrock for sheet metal in new cold air runs.

Both wall stacks and between-joist returns were built of Sheetrock following application methods clearly explained by the photographs. The resulting construction meets all requirements of imposed codes and Washington regulations.

Wall Stacks

In the three bed rooms on the second floor there was not one return in the old installation. Nor was there any return from the hall or stair well. Since a part of the remodeling research involved making one room available for rental, it was decided to take returns from each bed room, along outside walls. These are baseboard openings and Sheetrock was used to build the register box and stack. Construction (see photographs and sketch)

lined the stud space with four pieces—back (nailed to the wood sheathing) two side pieces (nailed to a 1 by 4 wood strip inside the back and front sheet) and a face strip (nailed to the side nailing strips). Result—a smooth, clean, fully lined space.

To make the connection between pieces the edges of the sheets were butted together and nailed at close intervals.

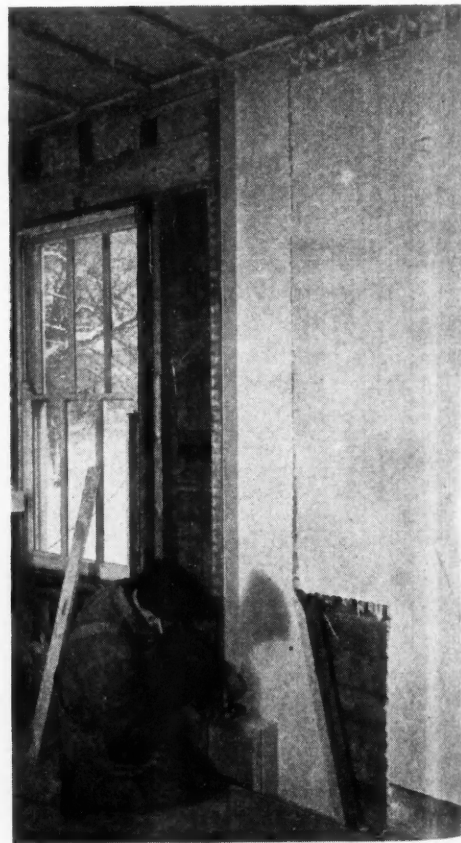
Returns Between Joists

The construction developed for full-lined returns between joists is shown in the photographs (which also show erection procedure) and in the detail. Sheetrock was nailed to the sub-floor; then two side nailing strips of the depth of the duct were nailed to the joists and Sheetrock strips of the same width nailed to the nailing strips. The bottom is closed in by nailing Sheetrock joist to joist.

The advantages of this construction are—a



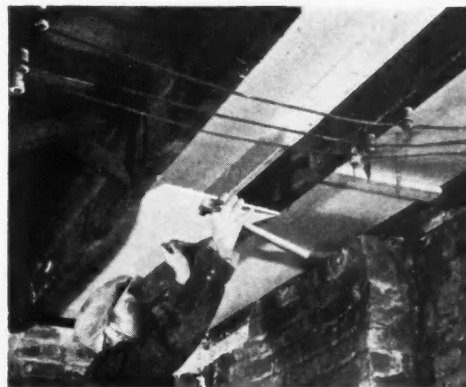
Left—Sheetrock stack built by nailing a back sheet to the sheathing, side strips to wood nailing strips, and the face strip to the nailing strips as shown in the sketch opposite. Center—Register box made by nailing Sheetrock pieces to sheathing, studs and a header. Right—Flexibility of Sheetrock application shown by offset stack around first floor return in adjoining stud space. Dividing stud was cut off and a new sloping stud put in place.





The first step in building the between-joist return is to nail the top strip to the sub-flooring. This meets Critical Materials List specification for a sealed top and joints. Fairly long strips can be handled.

Below—Second step is to cut and nail side strips of wood to the joists. These wood strips seal the top corners and establish the desired duct depth. They can even be graduated deeper toward the furnace if desired.



Last, the bottom strip is cut to fit tightly between joists and is nailed along the wood side strips. See sketch below. Cross joints are sealed by nailing a wood strip from joist to joist.

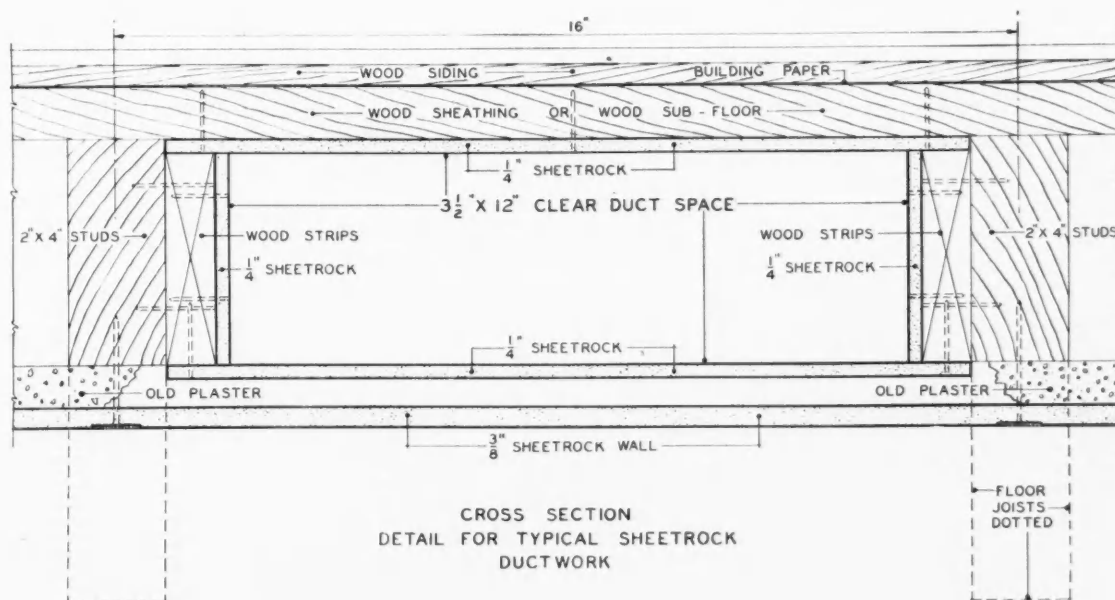
fully lined return; satisfactorily sealed corners; duct depth adjusted to volume. And within the limitations of the FHA inspection, these ducts may be carried within 6 feet of the furnace and be acceptable.

One set of three photographs shows the method of joining between-joist return (made of Sheetrock) with the galvanized iron return in the basement. The square galvanized collar was braked into a clinch edge which goes against the under

side of the Sheetrock with the "eared" flange hammered over on the inside of the Sheetrock after insertion.

Materials and Labor

In the USG Remodel Research House a careful check was kept of all materials and labor required for the alteration of the heating plant. This labor and materials check is shown in the Heating Installation Summary on the next page.



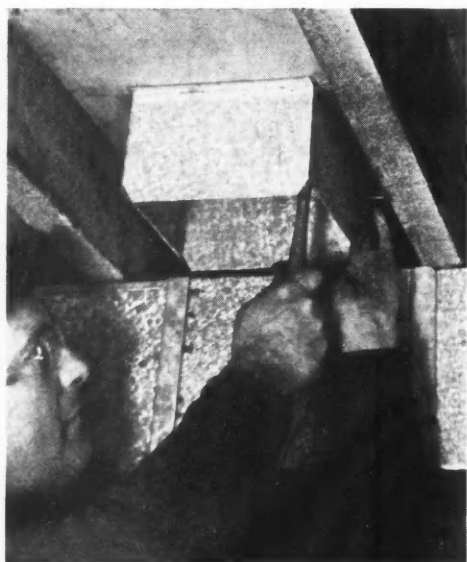
Typical application of Sheetrock as a stack or a between-joist return. Where old plaster is left in place, the front face of the stack can be the inside surface of the wall instead of the construction shown where a wholly new wall is built.



To connect the Sheetrock return to the metal duct within 6 feet of the furnace a square hole is sawed in the bottom.



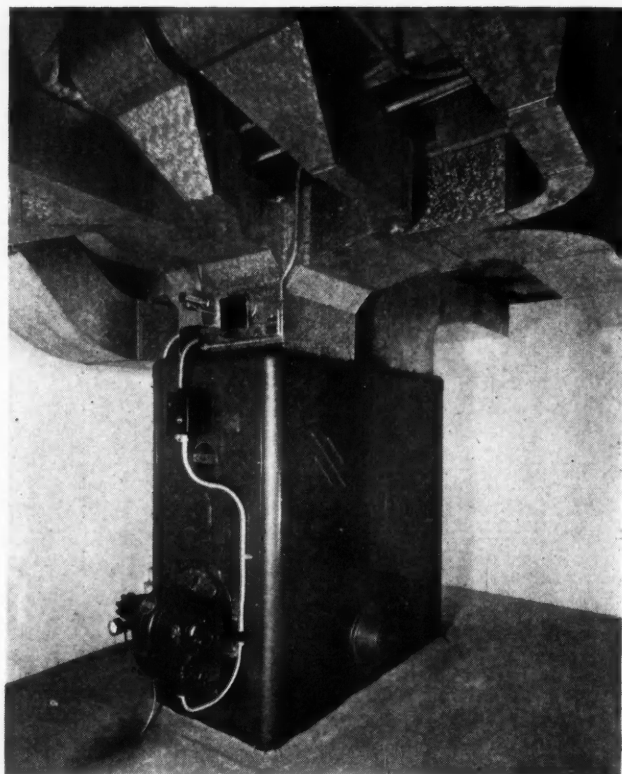
A square metal collar is made with a standard clinch flange and a serrated top flange to squeeze inside.



Pushed into the hole, the teeth are hammered down to make the collar tight on the Sheetrock bottom.

Right—All duct work (supply and return) within 6 feet of the plenum is metal. In the USG Research House an oil-burning, forced warm air Crane furnace was used in the remodeled installation.

Normal Sheet Metal Shop installed the furnace and sheet metal work



Heating Installation Summary

Labor

Carpentry Labor
Electrical Labor
Piping Labor (Oil Tank and Burner)
Heating Unit—Assembly Labor
Sheetmetal Labor at Job
Sheetmetal Labor in Shop

Number of Hours

82½
4½
9
17½
88
78½

Materials Used

20 Lin. Ft. 2" x 4" wood
161 Lin. Ft. 1" x 3" wood
6 sheets 4' x 12' ¼" Sheetrock
2 sheets 4' x 9' ¼" Sheetrock
12 Lin. Ft. Thermostat Wire Conduit and Motor Connections
1—275 Gal. oil storage tank
1—Crane Oil Burner Unit
1—Crane Warm Air Unit No. R.C-100
2—6" x 14" Registers
3—6" x 10" Registers
18—6" x 12" Registers
1—4" x 10" Registers
2—4" x 20" Grilles

Installed by

Carpenter Contractor
Carpenter Contractor
Carpenter Contractor
Carpenter Contractor
Electrical Contractor
Piping Contractor
Piping Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor

Sheetmetal for Ducts (26 ga.)

Materials Used

Width	Length	No. of Sheets	Square Feet
36"	120"	7	210
30"	120"	8	200
28"	120"	1	25
36"	96"	9	216
32"	96"	12	240
30"	96"	9	180
28"	96"	30	600

Installed by

Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor
Sheetmetal Contractor

Sheetrock cold air ducts—93 lin. feet.
Sheet Metal cold air ducts—63 lin. feet.
Sheet Metal warm air ducts—163 lin. feet.

Shop-Made Metal Connectors To Hold Board Edges Together

RUDY GUENTHER of Accurate Mfg. Works, Chicago, has given considerable thought to methods of making air tight corner connections and stiffening connections between duct sections. Mr. Guenther's ideas, worked out in his shop, are shown in Diagram A.

To get an air-tight longitudinal connection, four metal connectors are suggested as shown in Details 1-A, B, C, D. Two alternatives of the continuous metal strip are shown (Details 1-A, 1-B)—one with the continuous strip on the inside and scrap washers outside; the other with the continuous strip outside and the washers inside. Choice will rest with assembly methods, but it seems that in fairly long sections and shallow ducts it will be easier to place the strip outside and punch the screw holes before assembly and hold washers on the screw by hand inside than the reverse operation.

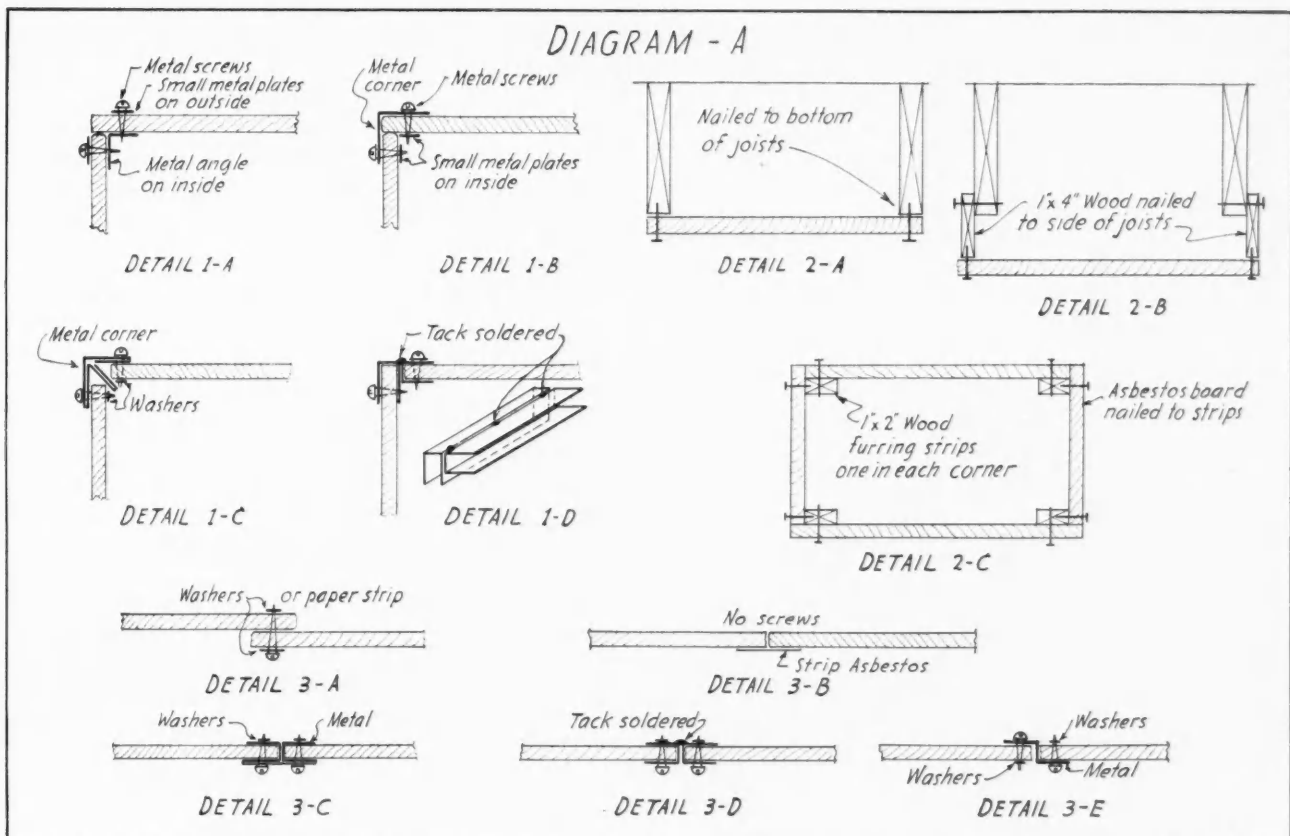
An interesting corner angle which adds stiffening is shown in Detail 1-C. This strip can be formed in the brake or can be purchased as it is a standard window and skylight strip.

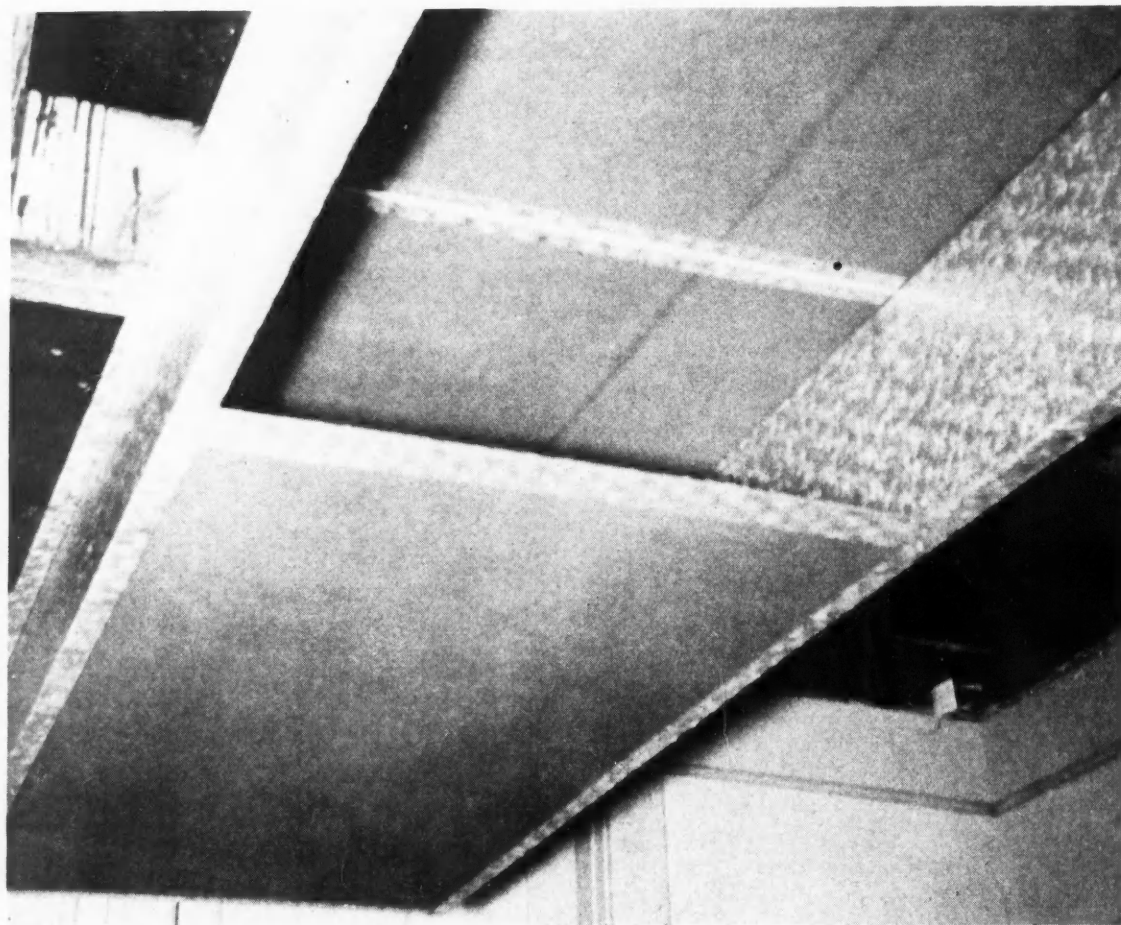
Detail 1-D and the variation 3-D has possibilities since it is easily formed and can be used

either way with tack soldering. It eliminates screw washers and can be drawn up tightly. The strip can be made in standard lengths and cut to fit in assembly.

Cross connections must do two things—join the sections, and furnish stiffening in wide widths. Several methods are shown in Details 2-A, B, C, D, E. For narrow ducts 3-B will serve, but offers little stiffening. Detail 3-A is suited to panning with the step down in the direction of air flow. Since the board is thin, a paper strip might be used without screws, but for safety perhaps two or three screws will provide additional security. Detail 3-C can be shop-formed and eliminates washers and gives a good stiff joint. Detail 3-E is also a simple strip and with screws and washers and offers rapid connection if the inside screws are run in on the ground and the outside screws run down after the two sections are erected. Sections cannot be longer than arm's length.

For panning joist spaces, Details 2-A and 2-B show usual application and a method of obtaining additional duct depth. For a full duct Detail 2-C shows a method of making sections in the shop where this construction passes local ordinances.





Sall Mountain Company's board and metal warm air duct saves metal by using No. 77 board for wide top and bottom and metal for shallow sides. A double S-cleat joins panel ends together.

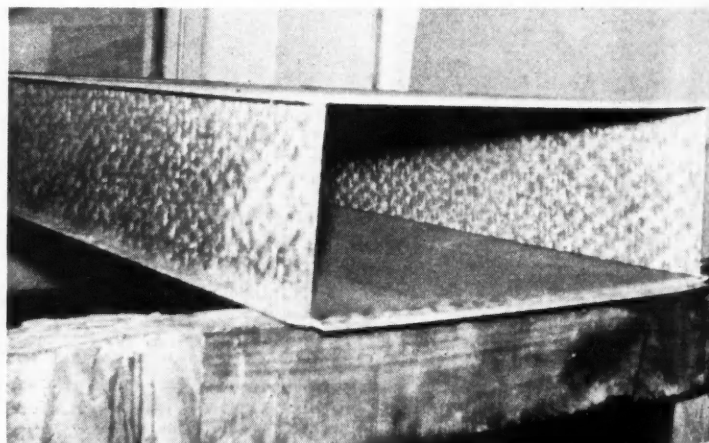
Sall-Mo No. 77 Top and Bottom with Metal Sides—For Warm Air Supply

SALL Mountain Company, a pioneer in substitute board, has developed an interesting combination of side metal and top and bottom board construction shown in the photographs. The metal sides make assembly easy and provide the necessary stiffness—quite as much stiffness as an all-metal duct.

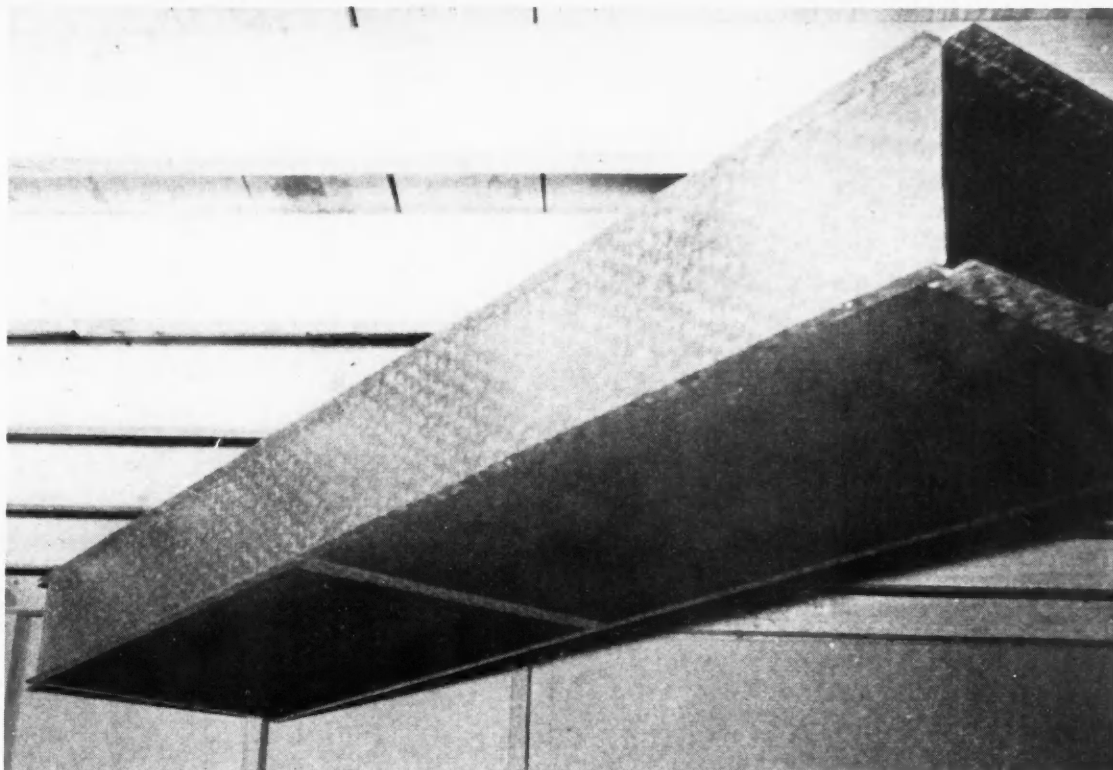
Flanged Pocket Holds Board Edge

The sides are flanged out and turned back the width of the flange in a loose fold so that the edge of the board can be inserted in the fold. After insertion, the fold can be flattened and metal screws run through the two metal folds and the board to hold the assembly together.

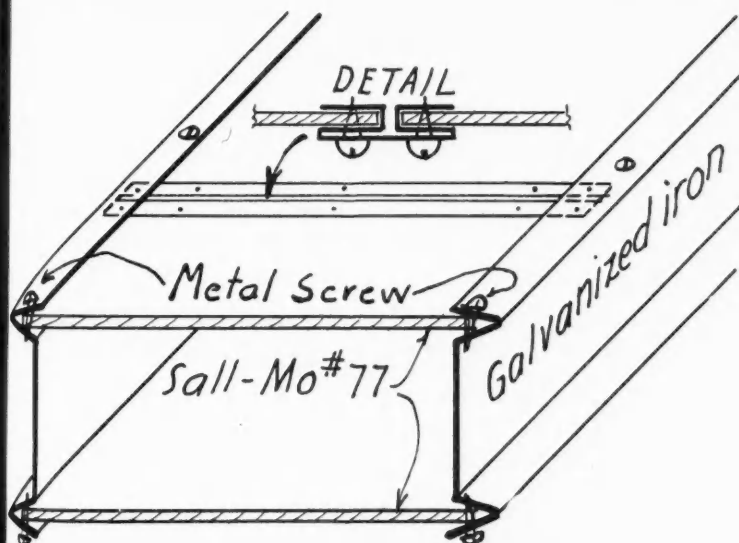
If a rail is used to punch and flatten the flange,



The metal sides give the section stiffness. Note absence of sag in 8-foot sections on two horses.



The two sides have a wide and loose flange top and bottom. The board edge is slipped into the fold; the fold is squeezed down and metal screws are spotted along the flange to hold the section together. The double S cleats are screwed to the side flanges. Construction details are sketched at the left.



this duct can be made in 8-foot lengths in the shop.

Cross connections developed by Sall Mountain employ a double S-cleat with the two board edges inserted in the S's and metal screws run through the board and three folds of metal.

This Sall Mountain construction eliminates the need for hangers where the duct runs across joists since the top flange can be nailed or screwed into the joist. Or a short strip hanger can be used by folding around the flange and screwing and nailing up the side of the joist if more than one nail is required per hanger.

As stated in the foreword, there are probably other interesting methods developed by readers using "board" in lieu of metal sheets. Since everyone in the industry is already or will be concerned with this problem, we invite readers to describe and sketch their methods. Ideas which contribute to our available data will be published.



Typical row houses of the type Wampler heats with gravity furnaces designed and installed as described in this article. The same type of structure is now finding acceptance in many larger cities.



Gravity Furnace for a Two-Story Row House

[*Defense House Heating*]

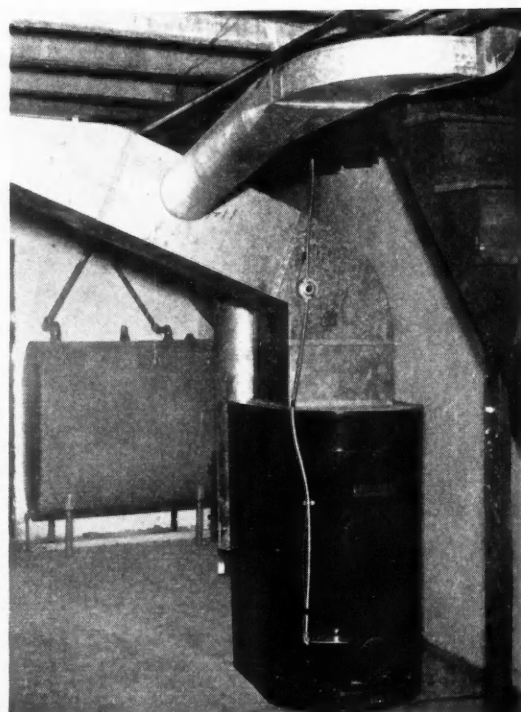
IN many cities, particularly in the east, the "row" house has long been popular with builders who want to place as many single-family housing units as possible in a block. Usually these houses have a continuous front and back wall with through fire walls dividing the units. Interior arrangement places the living room, dining room and kitchen on the first floor, with bed rooms and bath on the second floor. Basements are usually included to house the heating plant, laundry, etc.

Housing agencies in Washington have accepted the "row" house as suited to low-cost construction and builders have been able to construct these units well under the \$6,000 ceiling.

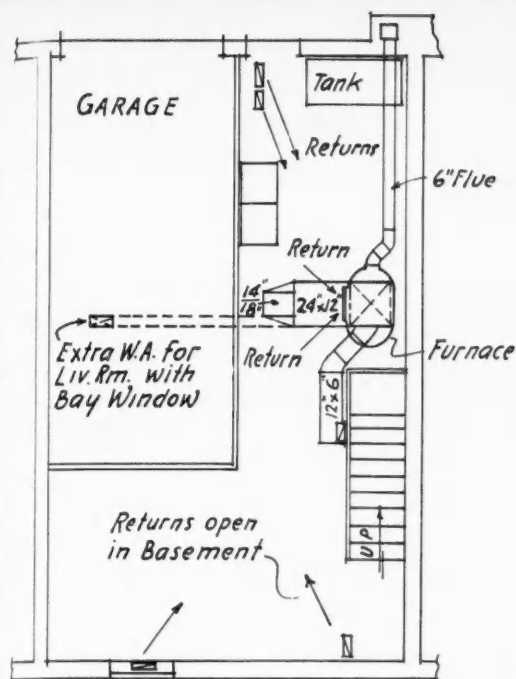
Heating the "row" house with a furnace has brought out ingenious plans, one of the most interesting being the gravity, oil- or coal-burning systems installed by H. F. Wampler Co. in Philadelphia. The plan of operations of the Wampler company were described in the February, 1942, issue.

The photographs, plans and detail sketches show the basic principles of the Wampler plan, using a gravity furnace, an upright, extended plenum to the first floor ceiling, open returns into the basement and a compact duct system.

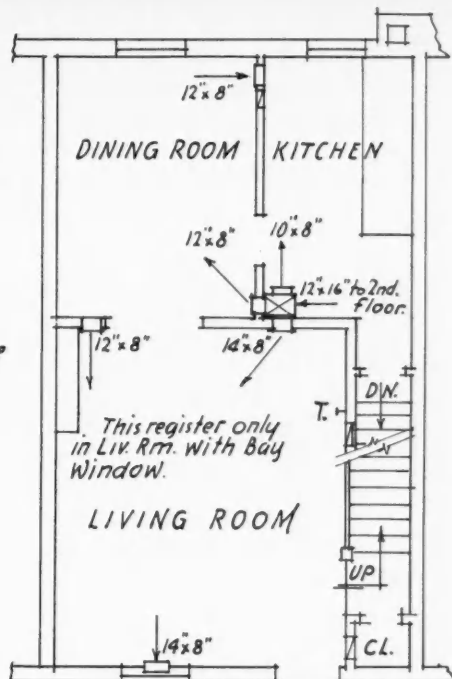
The houses pictured have a heat loss between



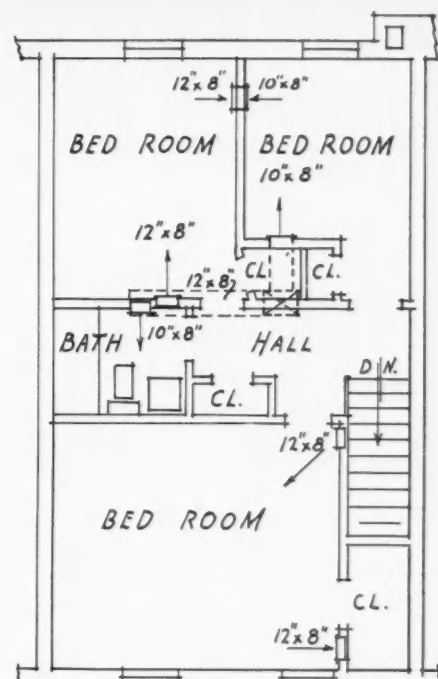
Oil-fired, Norge furnace in a row house. Coal furnaces can be used with full return ducts or no returns from upstairs. See text.



BASEMENT



FIRST FLOOR



SECOND FLOOR

The problem of locating the straight-up plenum to the first floor ceiling determines where the furnace is placed. The idea is to get short branches of as nearly equal length as possible. The plenum is concealed by plastering. Note returns from first and second floor; not piped to the furnace, but open in the basement. With coal, the returns will have to be closed or no returns used—instead, a hole in the casing. Below—Construction of a typical plenum and second floor branch.

30,000 and 35,000 Btu; the house in the plans being 32,400 Btu.

The Wampler Company believes that this heating system is just about as simple as anything in use in the Philadelphia area; further, the system has been very successful from a heat distribution standpoint.

From the furnace in the basement a uniform section plenum is carried up through the kitchen to the first floor ceiling and is then carried out between joists (see detail) to place registers in the rooms served as shown on the second floor plan. The master bedroom, usually across the front, is served by a separate stack from the basement.

For the first floor rooms, the stubs are taken out of the plenum as shown placing registers on inside corners of the rooms. If the house has a living room bay, which increases the room's heat loss, a second supply is carried across between

joists to a position on the inside wall as shown dotted on the basement plan.

Registers are placed in the baseboard and are stamped steel faces with louvres. To control air flow from registers, the louvre in the second floor registers is supplemented by a stack head damper so that volume can be reduced and thus get the required air volume from first floor registers. Without this double control, second floor registers possibly would get more air than first floor registers.

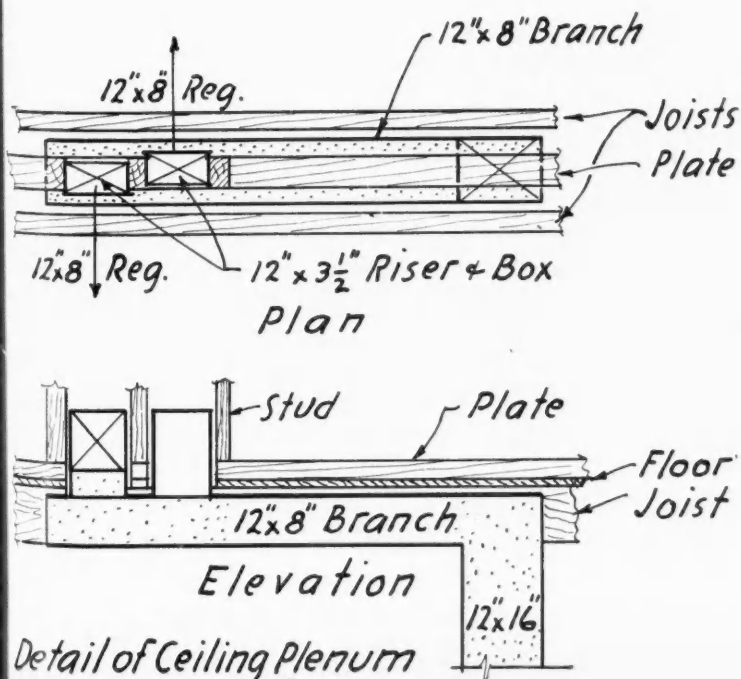
The first floor registers use the louvre to obtain balance, but stack dampers are not found necessary.

The usual register air temperature is between 120 and 140 degrees and velocities are from 150 to 200 feet per minute under gravity operation. While definite checks have not been made to determine velocities in the plenum, it is thought these plenum velocities are about the same as velocities from second floor registers.

These installations require approximately 175 pounds of 28-gauge sheets. Both galvanized iron and black terne have been used and Wampler foresees no difficulty with black iron if necessary. Further, this straight plenum with short ducts could be built with asbestos board almost as economically as with metal and with some practice the plenum and ducts would be satisfactory from an appearance standpoint. This appearance is not overly important in these installations because the builder conceals the plenum through the kitchen and all branches are either between joists or furred in. Only in the basement is the sheet metal work exposed.

One thermostat in the living room controls the oil valve on the oil furnace or the draft and check on a coal-fired unit. Through balance, as de-

(Continued on page 101)



An Emergency Installation Code

[Part 2—Simplified Heat Loss Calculation]

By S. Konzo

Special Research Associate Professor
Engineering Experiment Station, University of Illinois

Elaborate and costly engineering is out of the question for the contractor installing heating systems in war housing. The calculations must be made in a few minutes—yet it should be accurate to meet FHA inspection. The heat loss calculation method used in the Gravity Manual is both accurate enough and will pass inspection. Therefore, in this Emergency Code, the following simple method will be advocated.

Introduction

SECTION 512 of the Defense Housing Critical List of February 24th, 1942, specifies that the total hourly heat loss of the dwelling "shall be determined in accordance with the data and methods described in the current edition of the Guide of the A.S.H.V.E. or by an alternate method which results in not less than the amount determined by the Guide method."

The simplified method given in the new *Gravity Manual* of the National Warm Air Heating and Air Conditioning Association (obtainable at 40 cents from Association office at 145 Public Square, Cleveland, Ohio) is based on the data and methods described in the Guide. The following explanation of this simple, yet exact, method should convince heating contractors that heat loss calculations are relatively simple. Any one who can multiply one number by another will be able to establish an answer. As a matter of fact it should be possible to train a woman clerk in a few simple lessons to perform the calculations.

Design Temperature Difference

For each locality, a recommended outdoor winter temperature has been established for use in preparing heating estimates. Table 1-A in the Gravity Manual lists such outdoor temperatures for major cities in the United States and Canada. For example, the outdoor design temperatures for Chicago and Minneapolis are listed as —10 deg. F., and —20 deg. F. respectively. The design values for indoor temperatures are ordinarily considered as 70 deg. F., although bathrooms, sun rooms, and living rooms are frequently designed for temperatures of 75 deg. F. The "design temperature difference" is the difference in temperature between the indoor air and outdoor air.

For example, the "design temperature difference" for Chicago is 70 — (—10) or 80 deg. F.,

and for Minneapolis is 70 — (—20) or 90 deg. F.

Heat Loss Factor

The heat loss, in terms of B.t.u. per hour, should be determined for each room to be heated. This basic calculation is necessary regardless of what type of heating system is under consideration, and enables the designer to determine the size of ducts, and registers for the room.

The sum of the heat losses from all of the rooms in the house gives a value for total heat loss which is used in determining the size of the furnace.

The basic equation for determining the heat loss from a surface exposed on one side to an air temperature, t_i , and on the other side to an air temperature, t_o , is:

$$\text{Heat loss B.t.u. per hr.} = \left(\text{Area in sq. ft.} \right) \times \left(\frac{\text{Coefficient}}{U} \right) \times \left(\text{Temp. difference} \right)$$

The simplified method given in the Gravity Manual reduces this basic equation to a simpler form, as follows:

$$\text{Heat Loss B.t.u. per hr.} = \left(\text{Area in sq. ft.} \right) \times \left(\frac{\text{Heat Loss}}{\text{Factor}} \right)$$

Hence, the calculation consists of two steps:

1. To select the heat loss factor from Table 1, a portion of which is reproduced from the Gravity Manual, for the appropriate design temperature difference.
2. To multiply the heat loss factor by the exposed area.

Example

Given a sun room, 10 ft. by 12 ft. with 8 ft. ceiling, exposed on long and two short sides.

Ten windows, weatherstripped, each 2 ft. by 5 ft.

Unexcavated unheated space below floor
Cold attic above

Heat Loss Factors

(Extracts from Table 1 in Manual)

Exposed Walls No. 1	Heat Trans. Coeff. U	Heat Loss Factor (Multiply values shown by exposed area in sq. ft.) Design Temp. Differences, Deg. F.									
		40	50	60	65	70	75	80	85	90	100
(a) Frame, wood siding, paper, sheathing, studs, lath and plaster	0.25	10	13	15	16	18	19	20	21	23	25
(b) Same as (1a) substituting 1/2" rigid insulation for lath	0.19	8	10	11	12	13	14	15	16	17	19
Frame Interior Partitions No. 14											
(a) With lath and plaster one side; other side open	0.62	12	16	19	20	22	23	25	26	28	31
Ceilings with Attic Space Above No. 16											
(a) Lath and plaster, no floor above	Comb. Coeff. 0.32	13	16	19	21	22	24	26	27	29	32
Ceiling-Part of roof—No attic space No. 19											
(a) Lath and plaster, rafter, sheathing, shingles	0.29	13	16	19	20	22	23	25	26	28	30
(c) Same as (19a) with 3 5/8" rock wool or equivalent between rafters	0.08	4	4	5	6	6	6	7	7	8	8
Wood Floors over exposed or unheated spaces No. 23											
(a) Double floor on joists	0.34	5	7	9	9	10	11	12	13	14	15
Concrete Floors No. 24											
(a) Concrete floors, 4" thick on ground	1.07	0	0	5	8	11	13	16	19	21	27
Windows and Doors No. 26											
(a) Glass, single	1.13	45	57	68	73	79	85	90	96	102	113
Infiltration No. 28											
		N = Not Weatherstripped W = Weatherstripped (Multiply values shown by cubic feet of space)									
(a) Rooms with windows on one side	Air Changes N = 1.0 W = 0.6	0.7 0.4	0.9 0.6	1.1 0.7	1.2 0.7	1.3 0.8	1.4 0.8	1.4 0.9	1.5 0.9	1.6 1.0	1.8 1.1
(d) Sun rooms with many windows on three sides	N = 3.0 W = 1.8	2.2 1.3	2.7 1.6	3.3 1.9	3.5 2.1	3.8 2.2	4.1 2.4	4.3 2.6	4.6 2.7	4.9 2.9	5.4 3.2

Notes for Table 1 on Heat Loss Factors

The following general notes are pertinent only to those interested in the derivation of the heat loss factors, and may be otherwise ignored:

1. Air temperatures in the room below the ceiling surface were considered as equal to 75 deg. F.
2. Air temperatures above the floor surface were considered as equal to 65 deg. F.
3. Temperatures of unheated closets, partitions, and sub-floor unheated spaces were considered as the average of indoor and outdoor air temperatures.
4. The heat losses through ceilings with attic spaces above have been based on the combined coefficient of ceiling and roof, and take into account the fact that the attic temperature is dependent primarily on the nature of the ceiling construction.
5. The ground temperatures have been considered as equal to:

Outdoor Temperature.....	30	20	10	5	0	-5	-10	-15	-20	-30
Ground Temperature.....	70	65	60	57.5	55	52.5	50	47.5	45	40

6. The infiltration loss has been based on the air change method, which is generally satisfactory for residences and small buildings. For more precise determinations, the air leakage may be determined by the crackage method, and the approximate air changes per hour determined. The values shown in Construction No. 28, may then be selected for the nearest value of "air changes."

Heat Loss Data Sheet

Room	No.	Long	Wide	High	Running Ft. Exp. Wall	Gross Sq. Ft. Exp. Wall
Sun	1	12' 0"	10' 0"	8' 0"	32' 0"	256.0

Exposure	Table 1 No.	Temp. Diff.	B.t.u. Factor	Area or Cubics	B.t.u. Loss per Hour
Windows and doors.....	26, a	80	90	x 100	= 9,000
Net Exposed Wall.....	1, a	80	20	x 156	= 3,120
Cold Partition.....	x	=
Cold Floor.....	23, a	80	12	x 120	= 1,440
Cold Ceiling.....	19, c	80	7	x 120	= 840
Infiltration (Cubics).....	28d, W	80	2.6	x 960 cu. ft.	= 2,496

Total Room B.t.u. Loss per Hour..... = 16,896

Notes on heat loss data sheet:

1. Running feet of exposed wall = $10.0 + 12.0 + 10.0 = 32.0$ ft.
2. Gross square feet of exposed wall = $32.0 \times 8.0 = 256$ sq. ft.
3. Cubic = floor area \times ceiling height = $120 \times 8.0 = 960$ cu. ft.
4. Net exposed wall = Gross exposed wall minus doors and windows = $256.0 - 100.00 = 156$ sq. ft.
5. Note that values in Table 1 under Design Temperature Difference of 80 deg. F. was used in all cases. For localities having design temperature differences other than 80 deg. F. use values of B.t.u. Factors shown under the appropriate column.

Design temperature difference for 70 deg. F. indoors and minus 10 deg. F. outdoors is 80 deg. F.

The data can be included in the heat loss data sheet, as shown in the accompanying example.

Advantages of This Short Method

The following advantages may be apparent after a trial of the method proposed in the Gravity Manual.

1. The method is fundamentally exact. This is the A.S.H.V.E. Guide Method.
2. The answer is given in terms of "B.t.u. per hr." and not in terms of square inches of pipe, or square feet of radiation, or square something else. Hence the answer is applicable for the design of any type of heating system.
3. The heat loss factors are in whole numbers.
4. The multiplication involves the use of only two whole numbers instead of three numbers. The chances of making errors are greatly diminished.
5. The designer does not have to estimate temperatures in the attic space, in unheated partitions, in unheated spaces below floors, or of the ground. The heat loss factors have been determined beforehand with the appropriate temperature differences taken into account.

All that is necessary is to determine the "design temperature difference" for the given locality and use the factors presented in the proper column.

Register Delivery

The heat loss from any room or structure must be offset by an equal heat input to the room or structure, in order to maintain the air temperature in the room at the desired value. That is, if the heat loss from a room is 8000 B.t.u. per hr., then the *register delivery* must be at least equal to 8000 B.t.u. per hr. under design temperature conditions.

Also, if the total heat loss from a building is equal to 60,000 B.t.u. per hr., the "*register delivery*" required is at least equal to 60,000 B.t.u. per hour. The term "*net hourly output capacity*" which is used in the critical list of Feb. 24th, 1942 is the same as "*register delivery*."

If those who use the critical list will substitute the words "register delivery" for the words "net hourly output capacity," some of the confusion in terminology will be avoided.

Bonnet Capacity

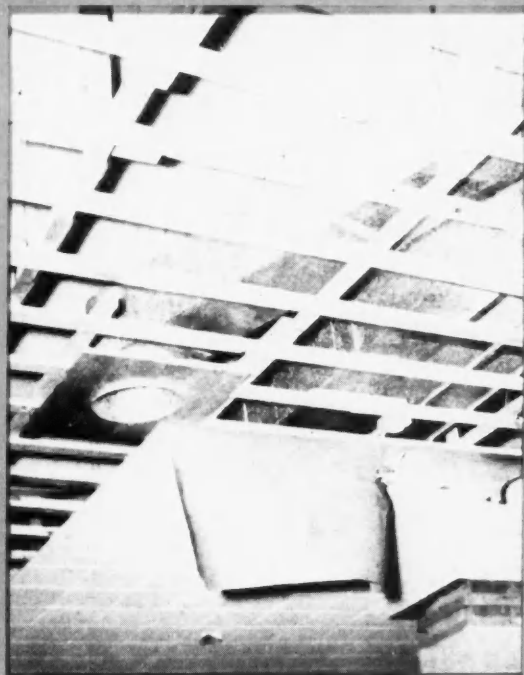
"Bonnet Capacity" is greater in value than "register delivery" and is the term most commonly stated in manufacturer's catalogues. In a forced-air furnace system, if the bonnet capacity is stated as 94,200 B.t.u. per hour, that means that a capacity of 94,200 B.t.u. per hour is available at the plenum chamber. If the unit is installed in the basement with trunks and branch ducts connecting the warm air registers to the

(Continued on page 97)

AMERICAN ARTISAN

SHEET METAL

SECTION



DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

CONTINENTAL
ANNOUNCES A

New
Lead-Sealed
Sheet



**WITH DEFINITE ADVANTAGES FOR
SHEET METAL WORKERS AND MANUFACTURERS**

Produced by a newly developed and superior process for coating steel with lead, Continental's new LEAD-SEALED sheet offers many important advantages over commercial long terne sheets and commercial galvanized sheets.

Continental LEAD-SEALED will find increasing use for furnace housings and pipes, ducts, fire doors, gasoline and oil cans, tanks, truck and trailer bodies, and scores of other manufactured products. In farm machinery and other industries, Continental LEAD-SEALED sheets will prove an excellent substitute for galvanized sheets.

Some of the advantages of the new Continental LEAD-SEALED sheet are:

1. Its lead-coating, applied by the new and special process, affords superior protection against rust and corrosion of the base metal.
2. The lead-coating serves as a lubricant in die forming.
3. It affords an ideal painting surface and requires no preparatory treatment.
4. It solders more easily than galvanized sheets.

Continental LEAD-SEALED sheets can now be supplied only on orders having a high priority rating. Inquiries for further information and samples are invited.

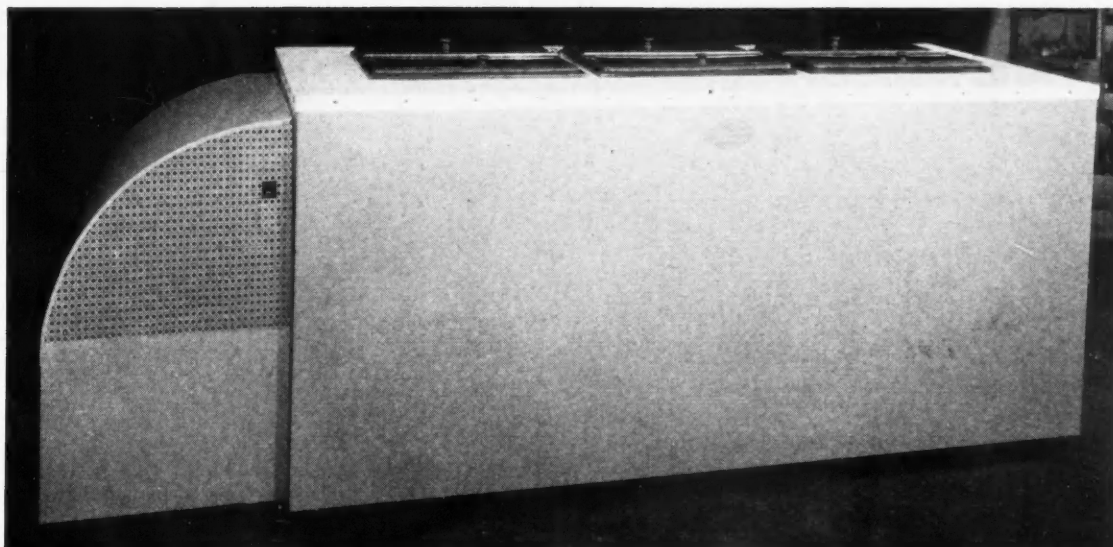
CONTINENTAL STEEL CORPORATION - KOKOMO, INDIANA

The Superior Sheet Steel Co., Canton, Ohio - A Subsidiary



SUPERIOR

CONTINENTAL STEEL CORPORATION



Fabrication of a "Farm Freezer"

By Emil Steinhorst & Sons, Utica, N. Y.

THE well-known sheet metal contracting and fabricating firm of Emil Steinhorst and Sons, Utica, New York, is making a strong bid for the frozen food equipment market with their three models of the "Zero-Temp—10° Farm Freezer."

This interesting piece of equipment, shown in finished and construction photographs, is designed for the farmer, suburbanite, grower of

fruit, vegetables, user of meat, game, fish, who desires to quick freeze his perishable foods and store them for extended periods under the quick freeze and frozen food method.

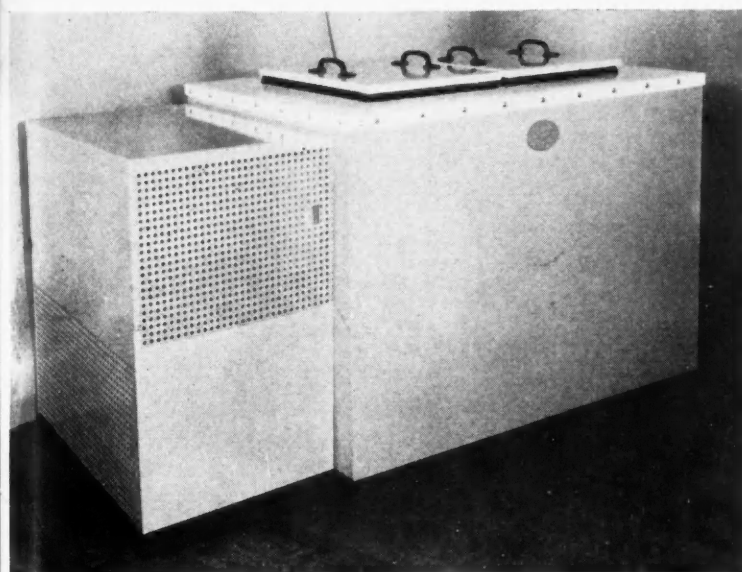
The general principles of frozen food storage are probably understood by most readers. Meats, vegetables, fruits to be stored are first properly prepared and wrapped for freezing and are then placed in the 10 below zero freezing compartment. When frozen, the wrapped packages are transferred to the zero storage compartment where the food may be stored indefinitely so long as temperatures are maintained.

Domestic Freezers Gaining Popularity

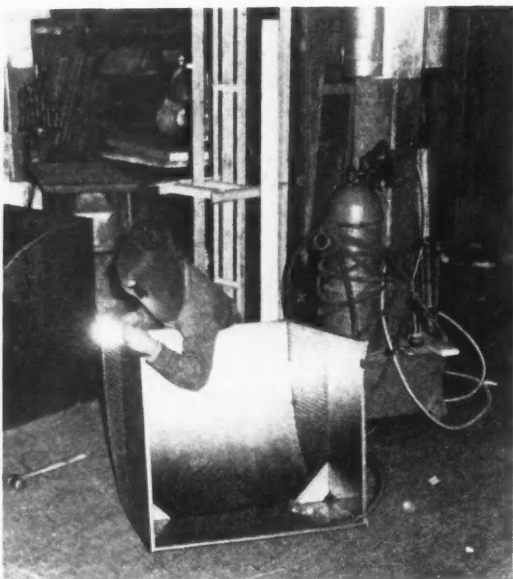
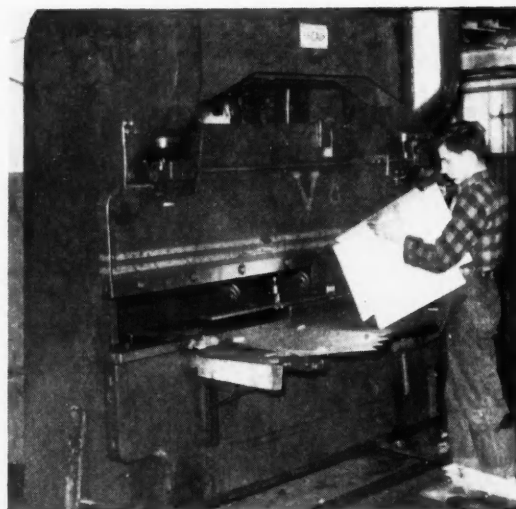
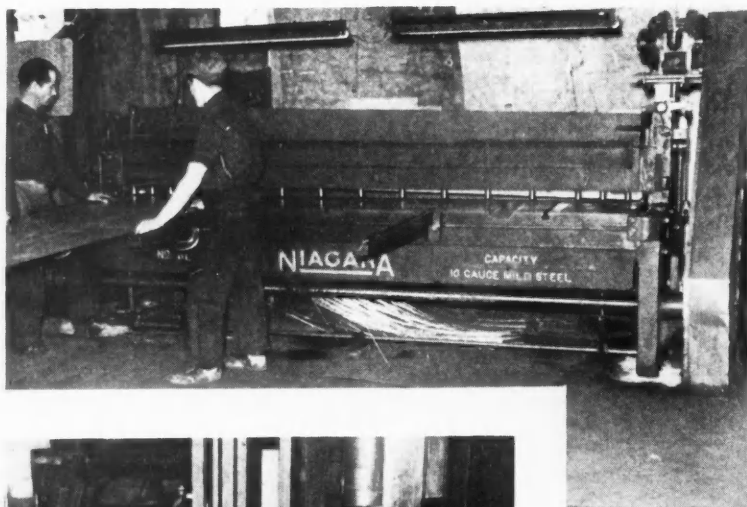
Up to recently most quick freezing was done in large commercial locker or freezing plants, but now several home freezers are on the market which, at nominal purchase and operating cost, make food freezing and storage a feasible home proposition.

The Steinhorst freezer has been particularly commended because in its cooling and freezing operation specially designed steel freezing plates with special eutectic hold-over solution prevents any rapid rise in interior temperature should electric power fail for a few hours. The construction and arrangement of the Steinhorst freezer has also been commended for its substantial cabinet, easy frost removal, slow heat leakage, and its avoidance of open coils.

It is with the construction of the cabinet and



Below—The 10 cu. ft. model (one quick freeze and 1 storage compartment) and, above—the 18 cu. ft. model (one quick freeze and 2 storage compartments). Cooling mechanism housed separately at left.



Upper, left and right—The Steinhorst shop is completely equipped with power machines capable of handling plate. First freezer operations shear and form pieces. Lower, left—The expanded metal and the top and base of the machine housing are tack welded and reinforced. Lower, right—Steinhorst considers an attractive finish a sales adjunct, hence a complete finishing department with baking ovens is maintained.

the fabricating methods used to build the cabinet that this article deals.

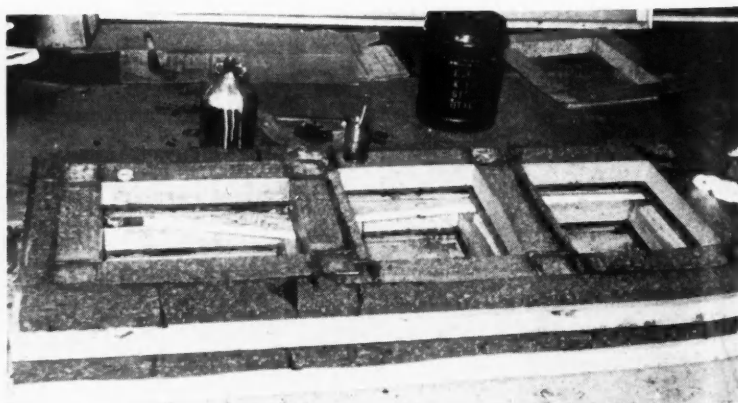
Perhaps the distinguishing feature of this cabinet is the absence of any wood or steel framing. Instead there is an 18-gauge inner cabinet and an 18-gauge outer cabinet held apart by the 5-inch thick cork insulation in side walls and floor. Seams are Pittsburgh, soldered or welded, depending on strain. The units are furnished with skids formed of 10-gauge steel and welded to the bottom. Skids are recessed for toe room.

In the large Steinhorst plant the sheets to be formed are sheared in the basement and formed in a first floor press department. Assembly of the cabinets is simple. After the outer shell is put together in jigs, the insulation is mopped into the shell with hot cement and the inside shell is put inside the insulation. Only the temperature wiring and the refrigerant lines pass through the insulation.

The formed top is bolted to the outer shell (see photographs). To obtain rigidity in the top, an assembled wood frame is used as shown in one photograph. The top is assembled upside down, as shown, and is placed in the steel cover when the insulation cement has set.

The pre-formed plastic mouldings around the openings are then placed in the openings and the top is put on the cabinet. Meanwhile the coil plates, electric plug for the freezing compartment fan are placed in the compartments.

Compartment lids are insulated with 3 inches



Tops are assembled upside down with the top on the bottom. Insulation is filled into a wood frame which stiffens and deadens the top. Then the lid opening metal frames are placed and, last, the steel bottom is laid on and bolted to the top through the flanges.

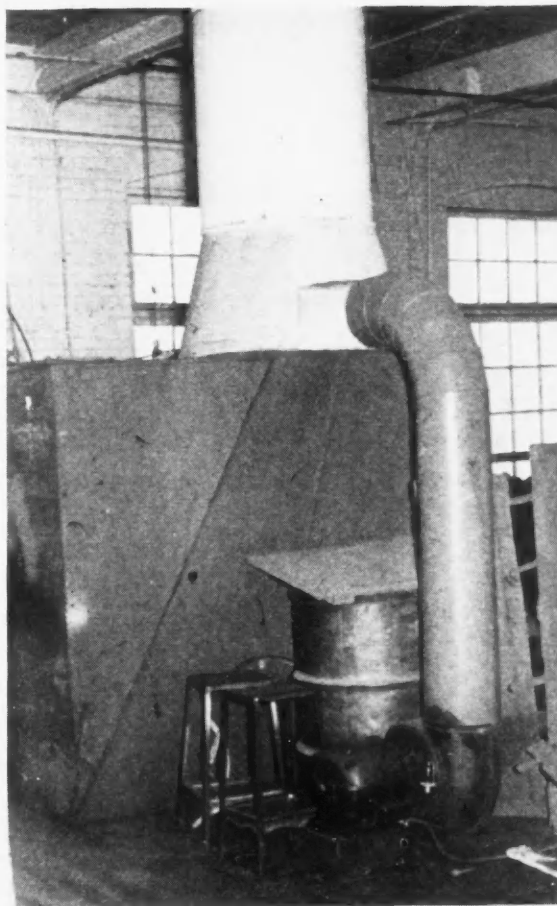
of cork between a two-piece metal cover to which hardware and rubber gaskets are attached.

The motor and refrigerating machine are housed in a ventilated cabinet attached to the freezer. This 18-gauge housing uses perforated metal as shown in the photographs. The pre-cut perforated metal is tack welded to the flange of the top and base and then the base is welded with the electric arc in tacks which are ground down prior to lacquer finishing.

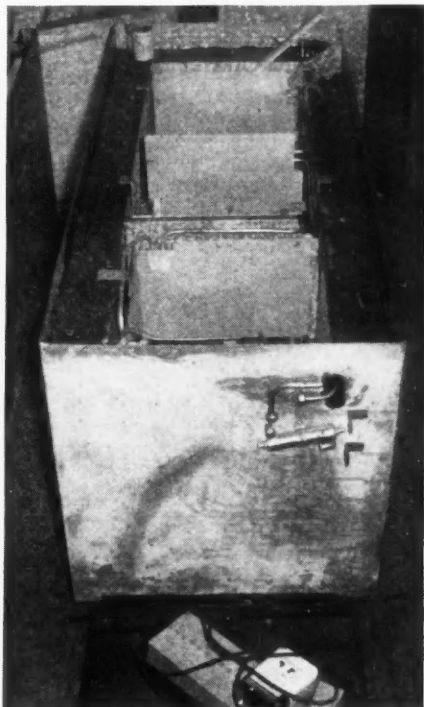
Attractive Finish Is Important

Steinhorst believes that an attractive appearance makes a machine more saleable so a complete finishing department is operated. The interior of the outside shell is not finished; neither is either inside or outside of the inner shell—the material is left in the natural galvanizing. But the outside of the cabinet and the top are rust-proofed and finished. Cabinet is finished in an air-dry automobile lacquer which is sprayed on after the two shells, insulation, and inner cabinet are all in place. The tops are also rust-proofed, but have a sprayed-on and oven-baked enamel finish—white, gloss—on a special undercoater. The tops are sprayed in a special department and are baked in gas ovens large enough to take a number of tops at a bake.

Incidentally, this shop has developed its own type of spray booth (Shown in a photograph) using an outside centrifugal blower. The pipe from the blower enters the exhaust stack as a ring around the base. The blower air blowing up the stack induces air from the spray booth to follow along with the fan air thus getting up the necessary booth exhaust without any of the booth paint-laden air touching the fan. The exhaust is quite as positive, the booth air is just as paint-free and there is no trouble with paint on fan blades.



This food freezer is only one of many products Steinhorst now makes or has made as regular production. Furnace casings, boiler casings, blower housings are made for the heating field; a great deal of special order stainless steel milk plant equipment is also manufactured regularly. Several of these milk plant items have been developed by Steinhorst and have become standard equipment. Milk weighing tanks, milk coolers, storage tanks and other items are typical.



Above—Steinhorst spray booths have remote fans which are piped to a stack ring. Air leaving the ring induces the necessary exhaust. Thus no paint spray reaches the fan.

Left—There is no frame in the cabinet. The inner and outer shells (welded) are positioned by the heavy insulation. Left picture shows assembly and chilling plates (smooth for easy defrosting). Picture are right shows final fitting of opening frames and hardware.



Leaks—Teasing as a Cross-Word Puzzle but— Darned Annoying

By Lawrence E. Gichner
Gichner, Inc., Washington, D. C.



Top—Picture 1. The left chimney is false; stopped at the roof and was open at the sheathing boards. Center—Picture 2. Stucco flashing was only ½-inch into the wall and let rain run down behind the stucco. Bottom—Picture 3. The football effectively stopped the drain.

QUIZZ and cross word puzzles are pleasant entertainment, but nothing compares with a roof leak problem as a real brain teaser. In the roofing business there are always new situations to keep one mentally alert.

Water is a tricky substance; its devious means for penetration are limitless; its potentialities for creating new situations are without end.

The frequency with which seasoned mechanics

have to return to previously worked on jobs is proof enough that some elusive leaks are difficult to find, stop and remedy.

Every financially successful roofer allows himself some leeway in estimating to take care of return calls for the unforeseen. Such leeway is just good job insurance.

Scrutinize the picture of the residence (illustration 1). From all appearances it is just a regular house. There are thousands similar to it in my locality—brick face, slate roof, two chimneys.

The chimneys leaked. Splotches on the third floor attic ceiling were there to prove it. The mechanic fixed the flashings and re-cemented the reglet. On one chimney the leak stopped. On the other it persisted. The tenant insisted she could hear the water dripping in the ceiling during every rain. We checked further and to our utter amazement discovered that the left chimney was false. It had just been stuck up there for appearance sake, went no further than the roof and, since it was open to the sheathing boards, water simply poured through to the ceiling below.

After we capped over the top with metal the leak and our worries stopped.

The modern store front is providing lots of leak repair work. The old type show window frequently leaked in the roof. On rare occasions it was a seam in the metal cornice. But today with advent of glass, cement surfaces, sunken awning boxes and two, four and five foot projections above the show window glass, the potential places that can cause trouble have increased.

Glance over illustration number 2. At every rain, water was ruining merchandise and display paraphernalia. First we caulked the obvious cracks in the glass sign. After the next rain we pointed up between the glass and metal trim. The next rain we checked on the spout that was concealed above the show window and completely covered with plaster. Next we checked the stucco



Left—Picture 4. Dead pigeons and debris closed the drain and formed a pool which over-ran the flashing. Right—Picture 5. Slate-flashing meeting line lower than parapet let water from snow into this church instead of over the parapet.

from above the rear show window flashings and here we found that the metal did not return more than $\frac{1}{2}$ inch. Driving rains soaked the huge stucco area that rose two stories above the show window and drained behind the flashings. We added new material deeper into the wall and that wrote finis to this headache.

Improper and faulty flashings cause an amazing number of leaks. Knowing this, why wasn't the flashing checked into first. Also, why didn't we simply look inside the chimney?

As in most problems, it all seems, oh! so easy, after one learns the answer. But the story is not so simple when one is in the dark, arduously struggling to find the solution.

There are conditions that cause an infinite amount of interior damage, whose solution is exceptionally easy. Illustrations number 3 and 4 graphically show the source of one of such conditions—stopped up gutters and scuppers. Picture 3 is on a large factory building where a football clogged the outlet. Number 4 is on a church where debris, plus dead and dying pigeons were the thumbs in the dike.

Comparatively speaking, churches have greater trouble with their roofs than owners of residences. On reason—they are larger—another important reason—structural conditions. Architects seem to think in terms of summer days and

forget the devastation wrought by winter's piling snows. In picture number 5 the slate came too low into the valley and allowed the melting snow to seep damagingly underneath them. The remedy was to remove several rows of slate and to build up this area with tin.

The same situation is illustrated in picture number 6. Here the split tin seams add to the problem. Wherever tin is bent at an angle it has a tendency to open at the seams. If the mechanic had joined the flat seam flashing portion with the standing seam roof at the angle this tearing might have been avoided.

Picture number 7 is also a church roof. This large flat seam valley gutter drains into an exposed outside down spout through a scupper in the wall. Trouble is encountered only in winter when the spout freezes solid and the melting snows back up water that runs through the standing seams. The remedy is to remove sections of the standing seam roof as far as the man's hand and install flat seam roofing. Then when the water rises it can readily overflow the wall and run outside the building where it does no harm.

With a little foresight on the part of architects and also sheet metal men a lot of trouble could be avoided, but then the roofers would miss a world of fun and the profit that goes along with that fun.



Left—Picture 7. Church roof with standing seam area lower than parapet let backed-up snow water into building when the spout froze. Remedy—flat seam area up to man's hand. Right—Picture 6. Split flat seams plus slate-copper line lower than parapet admitted water and was remedied by joining flat seam area with standing seam area at an angle.

Fabricating War Products

[Combination Cabinet and Work Bench]

As the first article to be discussed, the author has selected a cabinet bought in large quantity. The design is typical of many units having working tops and drawers and the construction is applicable to this type of furniture. This article describes construction and planning—in June we will present layout of parts, tools, jigs and fixtures, assembly. An alternative presentation might take one part and follow it through design, machining, tooling, fixtures, etc. We would like readers' opinion on which method of presentation will be most useful.

By Ernest E. Zideck
Sheet Metal Consulting Engineer

THE first item we will discuss in this series is a Combination Cabinet and Work Bench, used in military trucks, for storing tools and supplies needed in doing repairs, with the cabinet top to be the bench on which to do the repairs.

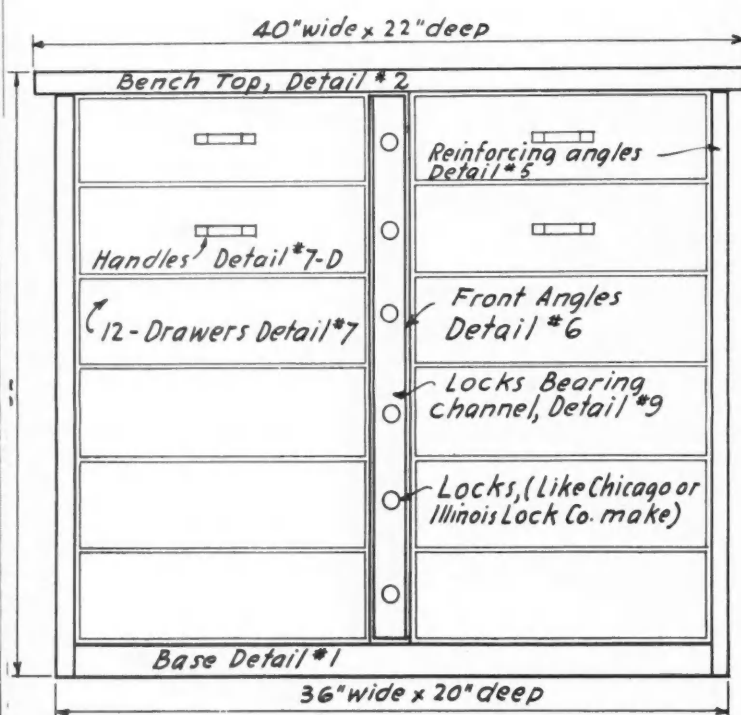
There are several reasons for the specific construction shown here. The truck travels over rough roads and ground, and the cabinet must be bolted to the truck floor to keep it in its upright position and prevent sliding back and forth. This same rough going necessitates the storing of the tools and supplies in containers or drawers

which cannot move in their bearings, spilling their contents. Further, the drawer, heavily laden with tools and accessories, must slide easily in and out and it is specified that the drawers not required at the time to open, remain securely locked. A provision in the bottom of the cabinet base is made for taking two pieces of steel rod or pipe, for the cabinet's easier handling in moving. Also, there are four holes in the bottom for $\frac{3}{8}$ -inch bolts.

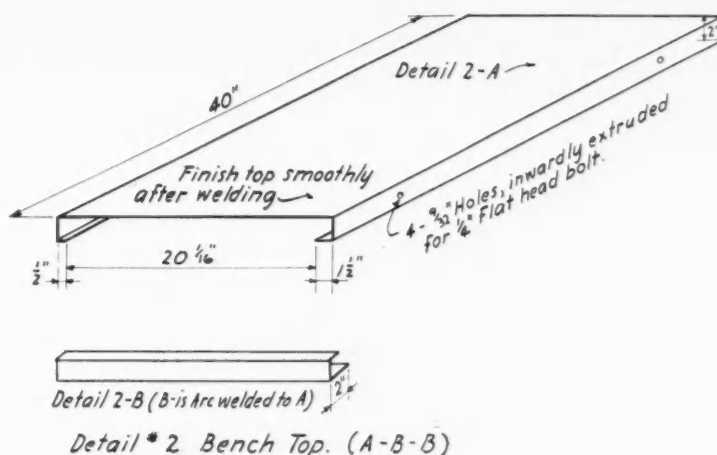
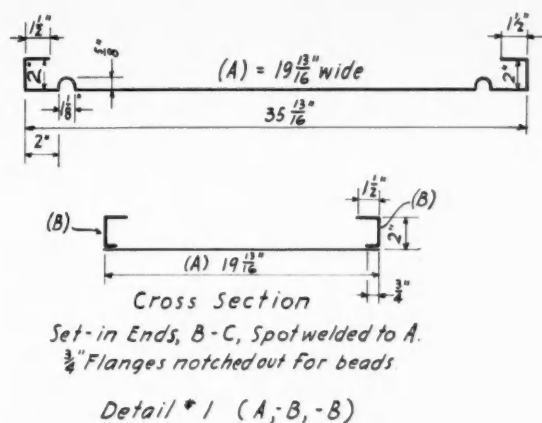
General Design and Assembly

The combination cabinet and bench is shown in the drawing No. 1. Detail 1 shows the cabinet's base, constructed of 14 gauge steel. Detail 2, the bench top, is of 12 gauge steel, flanged double, the vertical flange being 2 inches, and the returned flange being $1\frac{1}{2}$ inches in the front, $\frac{1}{2}$ inch in the back and 2 inches in the sides. The overall base measurements are 36 inches long by 20 inches wide, while the top measures 40 inches by 22 inches. The returned flanges of the bench top make the space between the flanges $20\frac{1}{16}$ inches by $36\frac{1}{16}$ inches, the top sliding over the frame and held to it by four $\frac{1}{4}$ inch bolts.

Detail 5 shows the simple angles, serving for corner reinforcement in the front of the cabinet. Similar angles, Detail 5-A, reinforce the construction in the rear corners. The double angles (Detail 6) form a channel in the front half of the cabinet, into which fastens the lock-holding channel (Detail 9) the channel held tight within the construction (Detail 6) by bolts threaded into the channel from the sides, as shown in Detail 9. The bolt-heads are concealed by drawers in locked position. All of the Details 4, 5, 6 and 9



Drawing #1 Front elevation of cabinet-bench for Military truck.



are shop fabricated angles of 14 gauge steel.

Drawers, 12 in number, detailed in 7,A,B,C,D, operate in the space between the aforesaid angle and channel, reaching 18 inches deep, the bottom of Detail 7-A sliding on upturned edges of metal of containers (Detail 3). The drawer rear end (Detail 7-C) by an extruded portion of the metal slides along the bead shown in Detail 3-A, guides the drawer and holds it in central position. Since the upturned edges of 3-A is the only metal to metal contact, friction of metal on metal is a minimum. Drawer handles (Detail 7-D) are shop fabricated of $\frac{3}{32}$ inch x $\frac{5}{8}$ inch flat wire stock, and are spotwelded, centrally, to the metal of the 16-gauge drawer front (Detail 7-B). The corresponding flange of 7-B is provided with a slot for the Lock Bar, shown in Detail 9-B. Details 7-A and 7-C are made of 18 gauge steel.

Drawers and Drawer Containers

In Detail 3 is shown an assembled series of drawer containers, of which the cabinet proper is built. There are two series of the containers to this cabinet, although additional series may be added, making the cabinet that much larger. Detail 3-B shows the rear ends to the containers 3-A, the ends being of the "set-in" type, set $\frac{1}{2}$ inch inside of the container, thus providing easily accessible flanges in the rear of the assembly for gun welding. All of the parts of Detail 3 are constructed of 18 gauge cold rolled steel.

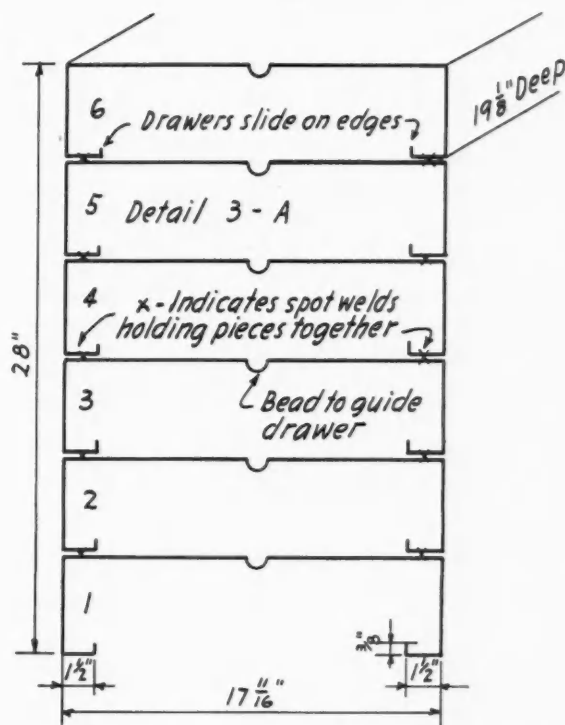
As shown in Detail 3, the containers 3-A are connected one to the other by spotwelding (gun welding) through the interior flanges bearing the upturns for the drawer to slide on. The assembly of containers reinforced by the vertical angles 5 and 6 (Details 5 and 6) which are gun welded to the structure, is specified to be arcwelded to these angles at the junctures of the containers 3-A; also the angles 5 and 6 to be arcwelded to the base, Detail 1, and to the top frame, Detail 4. Additional arcwelding is specified, in spots 6 inches apart, in the rear of the cabinet, where the container-ends and the flanges meet.

In Detail 4 is shown the top receiving angle frame, constructed of 14 gauge steel. The frame

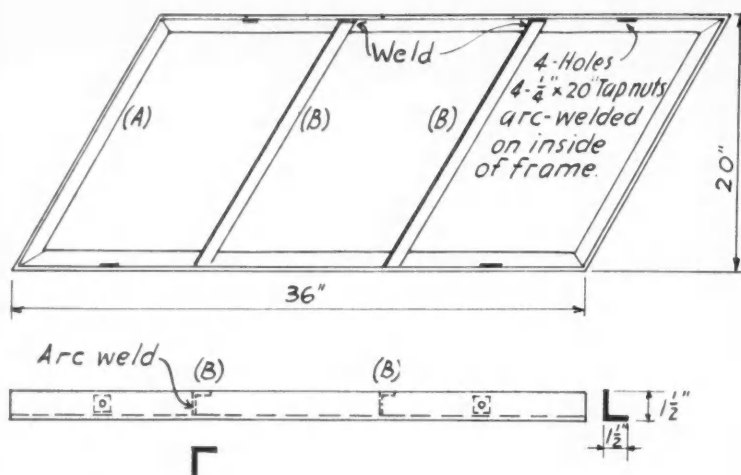
is of the same overall size as is the cabinet, and is gun welded to the cabinet similarly as are the containers, 3-A, welded together. The frame, 4-A, has two cross members, 4-B, arcwelded to it, the cross members being angles of 14 gauge steel, the flanges facing up, as shown in Detail 4.—There are four $\frac{3}{32}$ -inch holes drilled in the vertical flange of the frame, with $\frac{1}{4}$ -inch nuts arc welded on the inside face of the frame. Nut retainers may be substituted for arc welding of the nuts.

The bench top (Detail 2) has corresponding holes in its downward flange, for these $\frac{1}{4}$ -inch bolts. These holes are extruded to the inside of

Detail 3-B-Rear, Set-in $\frac{1}{2}$ " Flange all 4-sides. Spot welded to (A)



Detail #3, Drawer Containers 12
2-Series as shown



Detail #4, Top receiving angle frame (A-B-B)

the flange, for the flat-headed bolt to repose within the metal itself instead of the bolt-head protruding. The bench top is coated on the inside with a $\frac{1}{4}$ -inch layer of sound-absorbing preparation, this layer contacting the metal of the frame (Detail 4).

Locking Device

In Details 9, 9-A, and 9-B, the construction and operation of the locking arrangements are shown. The channel formed by the two angles, 6, 6, (Detail 6) in the front of the cabinet, is provided with slots corresponding to lock slots in the flanges of the front end to Drawer 7 as shown in detail 7-B. The locks-bearing channel (Detail 9) has similar corresponding slots in its flanges, the locking bar of lock, 9-B, moving freely within the slots when turned by the key. The locks, 9-B, are inserted through $\frac{7}{8}$ -inch Dia. holes punched in the face of channel 9, fastened to the face by lock-nuts which are parts of the procured locks. The channel 9 has provisions for $\frac{3}{16}$ -inch flat-headed bolts, threaded in from the side, as shown in Details 9, 9-A, 9-B and 9-C. The lock-bearing channel, 9, is held in 6 (Detail 6) by the four flatheaded bolts solely so that it may be extracted easily for eventual lock repairs. At the same time the channel, held by the four bolts hidden by the drawers, is amply secured within 6, to prevent breaking into the cabinet.

Essentials of Construction

This product, being quite simple and suited to simple, everyday fabricating means, presents no fabricating difficulties in its making. Except for the six locks, each lock securing two drawers, the number of bolts and nuts, the two pieces of threaded tubing and the sound-absorbing coating, the structure is wholly sheet and allied metal fabrication that requires no special dies or tools. The quite numerous notchouts, punchings and slottings can be made by existing means. In quantity production, several angle iron frames

or, fixtures, would be required for assembly and welding of the containers.

Braking-forming operations are standard and multiple brakings in one machine, at one stroke, are feasible. Welding is divided between the stationary spot welder, the gun welder and the arc welder, so that the flow of production can be maintained effectively, keeping every operator busy, from material handler and shearer through multiple provisioning work and braking-forming to fitting, diverse welding, abrasive finishing, final assemblies and inspection.

Like in any other quantity production, the fit of parts is of prime importance in this product. Layouts, patterns and templates, each checked minutely, are essential. Inspection at the machines, of gage, set-ups and of operations, is a prime factor in getting the parts made right, saving time in their fitting and assembly and insuring smoothly flowing work through subsequent operations.

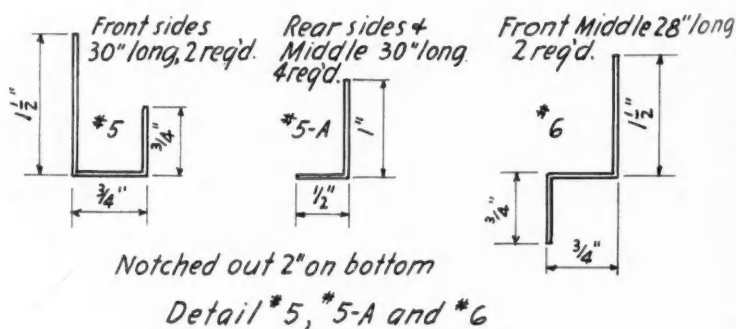
Sample Helps to Visualize Production

Obviously, before quantity production of any multiple-parts structure is gone into, a *sample* is built conforming to the specifications. In building the sample, certain simpler and time-saving features of construction will be discovered; but, mainly, the sample will prove the correctness of layouts and fits, so that the subsequently procured patterns and templates need only to be adhered to in production to insure smooth work of the operators and obtain the product wanted.

In this cabinet-bench, exact overall dimensions are most important, although a tolerance of .0025 inches, plus or minus, is specified. This especially applies to the bench top, which must fit into a given space. It is also important that the cabinet be built to uniform dimensions and the aforesaid *fixtures* to be used for assembly of the cabinet should conform to the given dimensions. Clearance allowed for the fit of the drawers into the frontal provisions in the cabinet is $\frac{3}{32}$ inch on top, on bottom and on either side. This may be easily accomplished by proper assembly in fixtures and by a uniform size of the drawer front ends.

Planning for Protection

1. Figure the sizes of the number of pieces in flat, arriving at the number of the right size



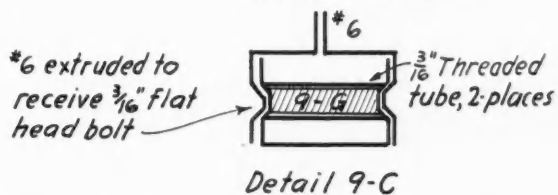
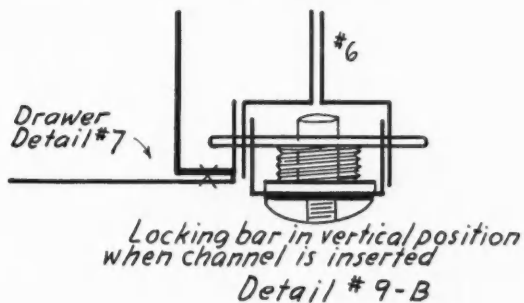
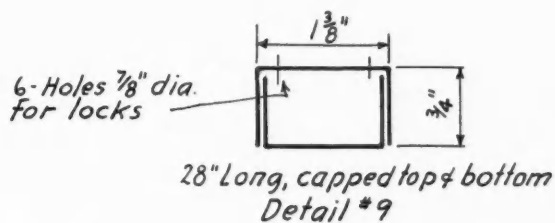
sheets required in one unit (the complete Cabinet and Bench); figure the cost of the sheet metal, the flat wire, the bolts, the locks, the welding rod, the sound-absorbing material, etc., and note the materials cost minutely, to be sure of knowing the exact cost, inclusive of the cost of the materials delivery ready for use.

2. Figure the number of shearings-cuttings (machine operations) to obtain the above pieces all sheared-cut to the right size. Include multiple shearings-cuttings at one machine stroke, where such is practical. Figure shearings-cuttings by thousands of identical pieces, at one gage set-up. Arrive at shearing-cutting cost on the basis of doing the work for at least one hundred units.

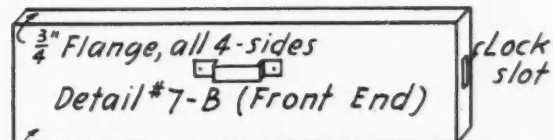
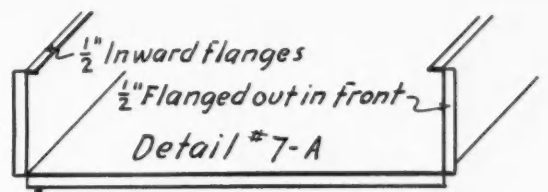
3. Figure the number of notch-outs in each piece and by what means each may be accomplished. Again figure the time consumed by such work on the above basis. Do the same with hole punchings and slotting, so that you have the costs of all provisioning in flat.

4. Figure the number of brakings-formings necessary in the amount of parts; figure the best means at hand or easily procurable for the work; multiple operations by one machine stroke, division of the work between the several machines at hand, arriving at a matter of fact estimate of the time consumed in such operations.

5. It will be necessary to have fixtures of angle iron or such other material built for the assembly of the containers (A), prior to doing spot or gun welding on them. Figure the cost of such structures, include the cost of patterns and templates, of dies and punches and such other means which must be procured to expedite production and have the work meet specifications. Add the cost of these means to the total.

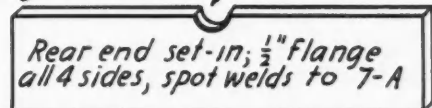


Detail #9, Lock bearing channel, 9-A, Lock, 9-B, Threaded tube.

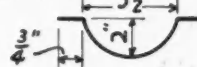


This fits over #7-A and is spot welded to $\frac{1}{2}$ " Flanges.

$\frac{5}{8}$ " \times $\frac{1}{8}$ " Extruded slot, (slides over bead in Detail-3)



Detail #7-C Spot welds to "B"



Detail 7-D

Detail #7, Drawers, (A-B-C-D)

6. Figure the time consumed in doing work on the parts after formation, such as extruding, fitting, pre-assembly spot welding, etc., but be sure the estimate is based on the use of efficient means and real productive work.

7. Figure costs of welding-finishing the base, the top, the top-holding frame, the container assemblies. Most of the work may best be done by gun welding, with the assembly on the floor and adequate tips for the welder should be procured. Welding work should be divided between the machines, some being done on the spot welder, some by gun welding, and then by the arc welder. Again the estimate should be based on spot welding at least one hundred drawers, gun welding together at least one hundred container assemblies, arc welding the already familiar construction.

8. Abrasive finishing of 100 bases, 100 top holding frames, 100 tops, etc., should serve for estimating the time consumed in the work.

9. Fitting-work necessary to insert the bolts, fasten the locks into the channel and the channel bolting to the structure, the drawer fitting and locking, etc., again should be figured on the larger quantity basis. Same should apply to the coating of the top with the sound absorbing preparation.

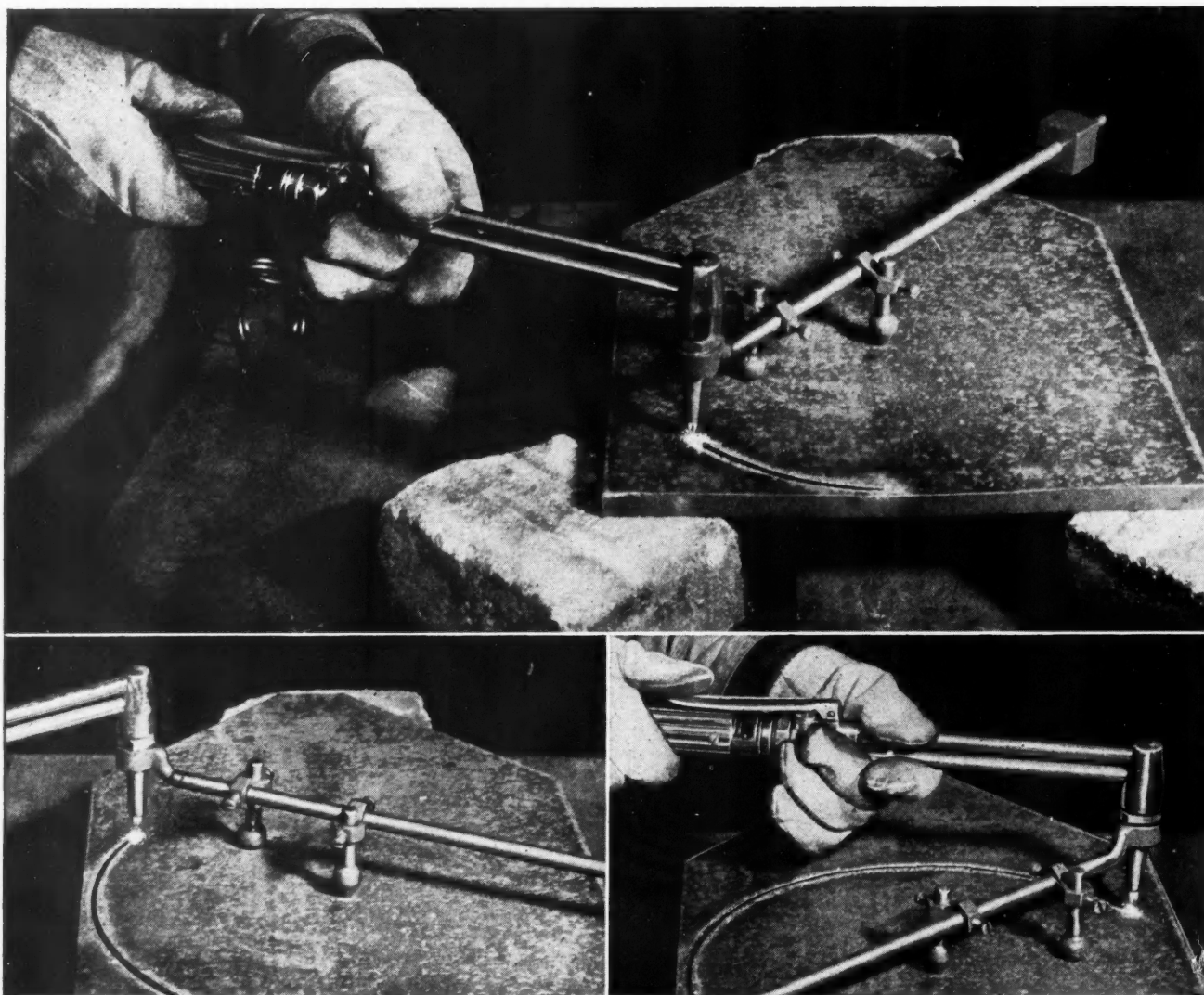
10. Supervision and inspection work at the machines and final, should be figured along with the other operations. If plant protection is maintained, the cost of same should be apportioned to the estimate.

[Part 2 in June will present jigs and fixtures, layout of parts, tools, etc.]

Simple Devices to Improve Cutting Accuracy

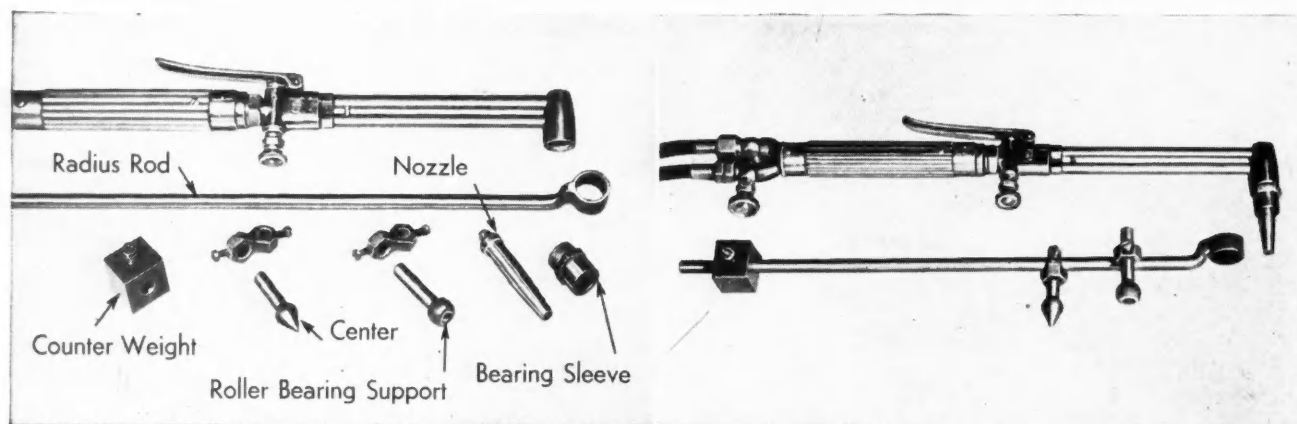
[Reprinted from Oxy-Acetylene Tips]

Small-Diameter Circles

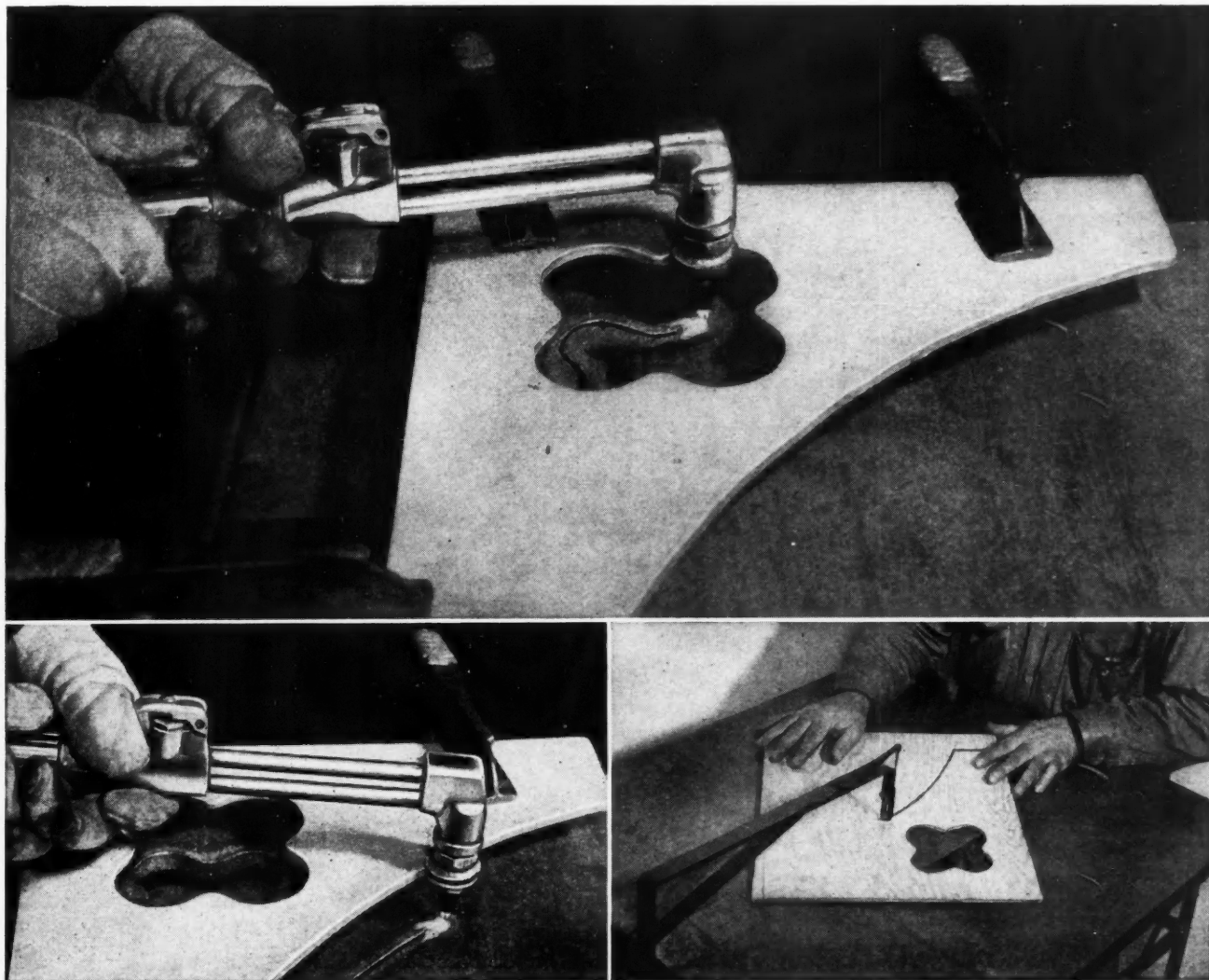


This radius rod makes possible the accurate cutting of circles from 2½ to 36 in. in diam. It consists of a ⅜-in. round rod bronze-welded at one end to a collar made from a piece of pipe. Fitting inside this collar and acting as a guide bearing for the cutting nozzle is a smaller-diameter sleeve made from a piece of pipe and welded to the blowpipe nozzle nut. The

center and the roller-bearing support are both adjustable vertically and horizontally. The roller bearing consists of a ball which rides in a nut and is held in place with a washer the hole of which is slightly smaller in diameter than the ball. A counterweight helps to keep the radius-rod center in the center mark punched in the plate.

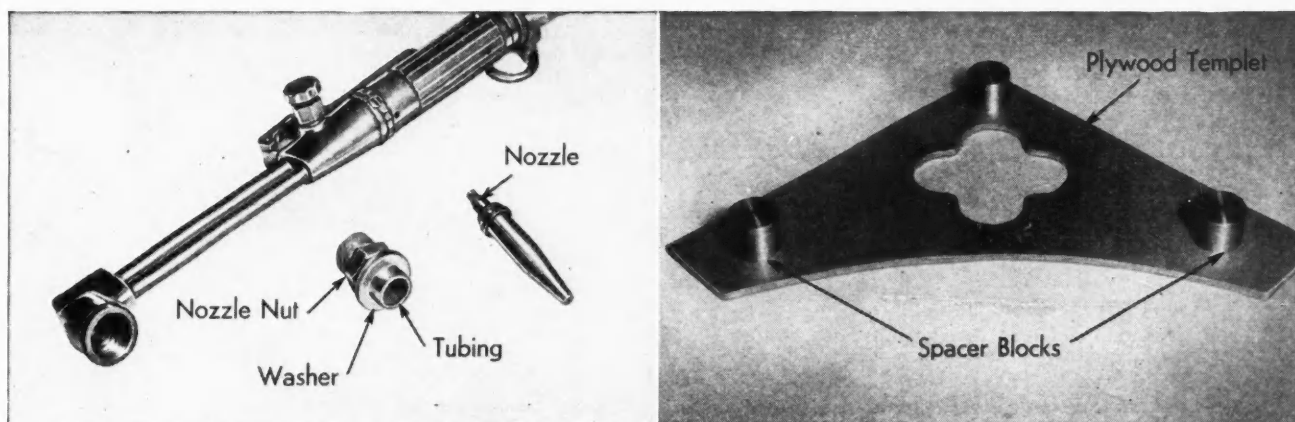


Shape-Cutting



These photographs show a method for guiding the hand blowpipe when close cutting tolerances are required, or when a number of identical shapes are to be produced. The guiding unit is a $\frac{1}{4}$ -in. thick plywood templet ($\frac{1}{2}$ in. thick for large templets, to prevent warpage). The shape to be produced is laid out on plywood $\frac{3}{8}$ in. undersize to provide for half the guide-unit diameter. The templet is then cut out with a home-

workshop type of jig saw. Edges are smoothed with a file and the templet is made heat-resisting with two coats of aluminum paint. The templet is spaced 1 to $1\frac{1}{4}$ in. from the plate to be cut with small steel separator blocks and is then clamped firmly in place. This provides space for exhaust gases to escape. A washer and piece of tubing welded to the nozzle nut make up the unit which rides along the templet edge during cutting.



Simple Vanes Equalize Exhaust Through Plating Tank Manifold*

By William P. Battista, Theodore Hatch and Leonard Greenburg
Division of Industrial Hygiene, New York State Department of Labor

At most plating tanks, space limitations necessitate thin exhaust manifolds while fume generation calls for uniform velocity along the slot. The customary non-vaned, graduated manifold gives wide variation in air withdrawal. By the application of simple vanes, spaced as described, more nearly uniform withdrawal was obtained.

IN the removal of fumes from plating, dipping, and other fume generating vats it has been the usual practice to install slotted hoods along the longest dimension of the tank—the slots being continuous, slotted, perforated—with the velocity into the opening set at a speed sufficient to keep the fumes from rising more than a few inches above the liquid.

The problem has been to keep entrance velocity uniform all along the intake. If velocity is

not uniform and up to calculations, removal of the fumes is spotty.

This uniform velocity along the slot is oftentimes not obtained in practice, chiefly because the usual non-baffled manifold does not maintain uniform suction along the length of the slot. What can be done to obtain this uniformity, without requiring impractical construction, was the subject of an investigation by William P. Battista, Theodore Hatch, and Leonard Greenburg of the Division of Industrial Hygiene, New York State Department of Labor and reported in *Heating, Piping and Air Conditioning*, February, 1941.

*Reprinted from *Heating, Piping and Air Conditioning*, February, 1941.

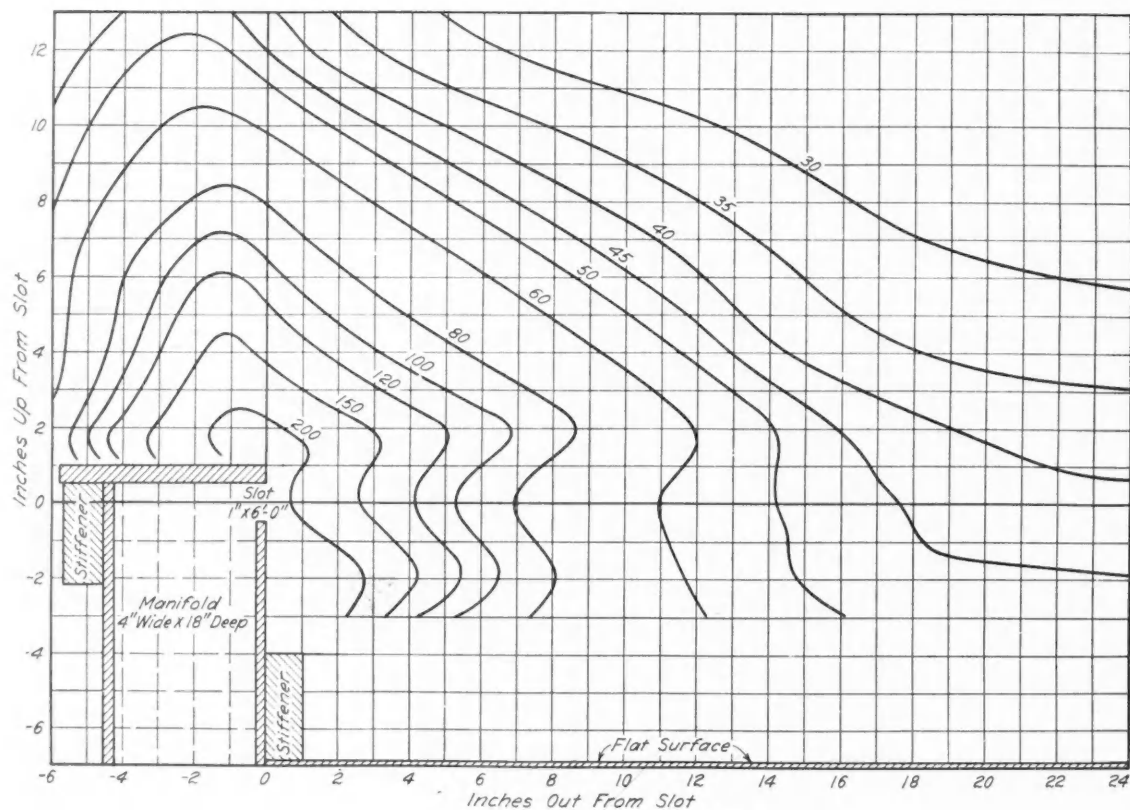


Fig. 1—Velocity contours for plating tank exhaust slot

The authors review the theoretical calculations involved in establishing the rate of ventilation, velocity distribution along the opening, relationship between rate of ventilation and tank width and then tested a laboratory set up to check the calculations and find best means for obtaining uniform distribution.

From the theoretical analysis these facts were established:

1—Air velocity at the slot must increase as tank width increases.

2—In a continuous slot intake the air velocity takes the form of concentric cylinders of velocity values.

3—The air velocity varies directly with the distance away from the slot.

4—Velocity contour curves calculated by accepted procedure for a slot velocity of 2,000 fpm are shown in Fig. 1.

What the authors established in their test is shown in the charts and drawings and explained by them as follows:

"The need for a uniform rate of ventilation through the entire length of the exhaust slot is most nearly secured by using a slotted plenum chamber of relatively great cross-sectional area in which the negative pressure is substantially uniform regardless of the location of the fan connection. Another method is to provide numerous pipe connections from the fan to equally spaced points along a slotted duct. Neither scheme is practical because of the limited space generally available around plating tanks.

Customary Tapered Duct Shows Unique Exhaust

A tapered duct with a slot of uniform width

with the fan connected to the larger end is found in practice to give a non-uniform distribution of flow. The use of an adjustable tapered slot is objectionable because the slot opening is seldom properly adjusted or fixed permanently in the correct position.

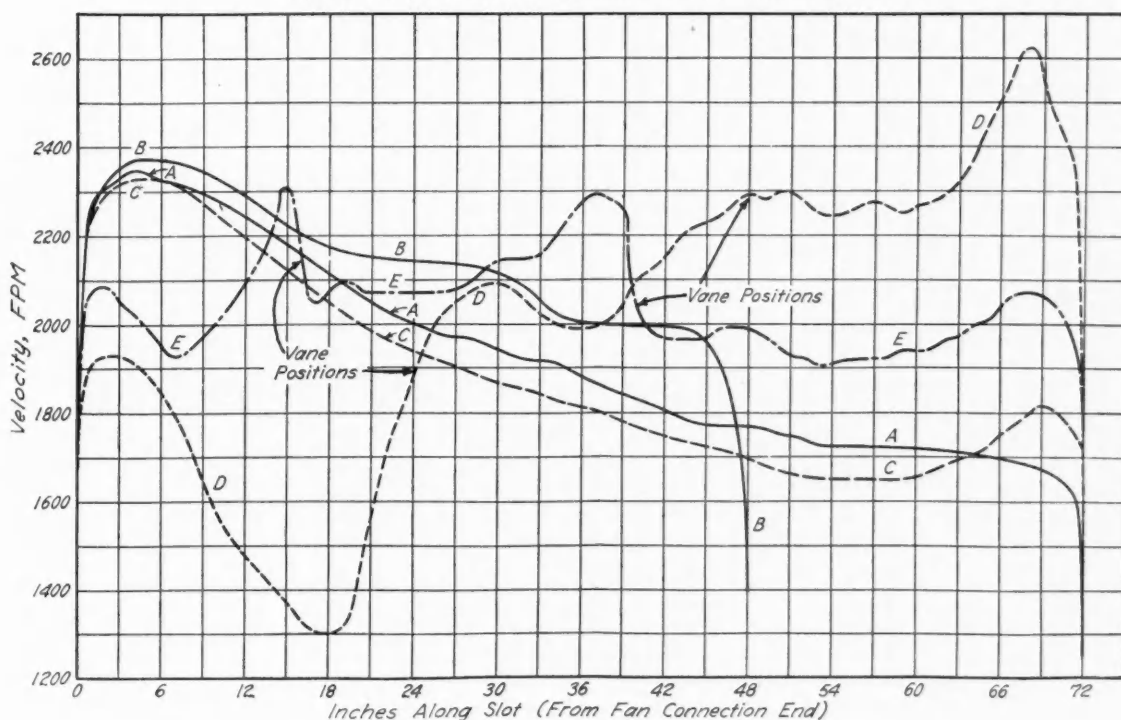
"The problem becomes one of designing a compact manifold of simple construction which will provide a reasonably uniform distribution of flow and does not occupy too much space. The simplest design is one which employs a manifold of uniform cross-section on the two long sides of the tank with a common exhaust chamber and fan connection at one end. The cross-sectional dimensions of the manifold should be as large as possible in order to approach the effect of a plenum chamber. In accordance with common practice in ventilation, the manifold may be provided with internal vanes, as required, to insure a uniform distribution of flow. The design requirements of such a manifold are developed below.

"The test apparatus was fabricated of $\frac{1}{4}$ in. plywood and $\frac{1}{2}$ in. lumber with stiffening members, as required. Internal dimensions of the manifold were 72 in. long, 18 in. deep and 4 in. wide. A 1 in. slot ran the full length of the manifold at the top of one side, thus providing an air intake area of $\frac{1}{2}$ sq. ft.

"A blast gate on the exhaust fan was adjusted throughout the tests so that the average air velocity through the slot was 2000 fpm.

"Velocities at the slot were measured with a direct reading air velocity meter using the appropriate attachment. Readings were made at the top, middle and bottom of the slot for each 1 inch interval along the slot. These were averaged to obtain one set of readings for the 1 inch slot opening.

Fig. 5—Velocity distribution along slot for the various test manifolds



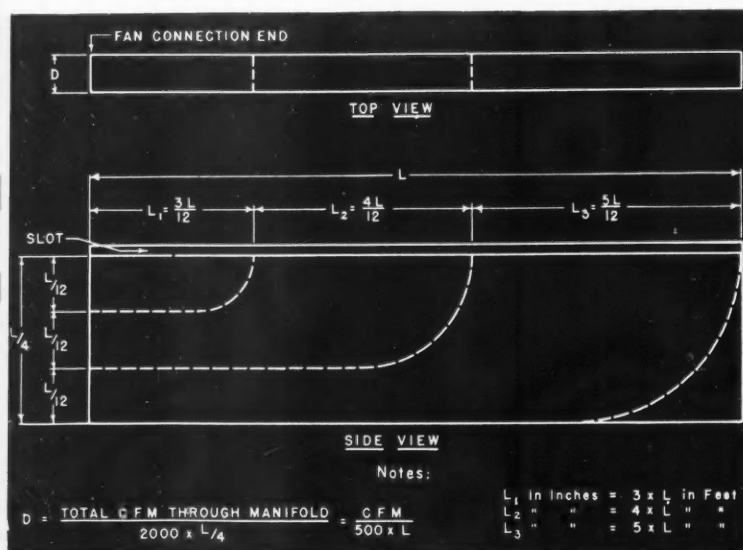


Fig. 6—Recommended design of exhaust manifold to obtain equal velocity and equal exhaust along tank. Also formula to determine spacing of vanes.

Tests Show Need for Vanes

"The first series of velocity readings were obtained with the simple manifold (Fig. 4A). The results are plotted as Curve A in Fig. 5 and reveal a marked decrease in slot velocity with distance from the exhaust end of the duct. In the second test, the manifold was shortened to 4 ft., thus making its cross-sectional dimensions relatively greater and more nearly approaching the plenum chamber effect (Fig. 4B). The velocity distribution, plotted as Curve B in Fig. 5, also shows a marked non-uniformity along the slot. The results of these two tests are in agreement with past experience and indicate that a simple uniform manifold of the limited dimensions permitted in practice is not acceptable.

"A single curved vane at the remote end of the manifold (Fig. 4C) served to increase the flow in this region, as shown in Curve C in Fig. 5, but did not significantly improve the distribution of flow through the slot as a whole. The results of this test indicate clearly the need for additional distributing vanes.

"Accordingly, two more curved partitions were installed in such a way as to divide the manifold into three separate sections, as shown in Fig. 4D and 4E.

"In Arrangement D, the vanes were equally spaced along the slot and arbitrarily located vertically so as to provide the greatest cross-sectional area in the bottom section which draws air from the remote end. The resulting velocity distribution, shown by Curve D in Fig. 5, indicates that too much air was drawn through the bottom section.

"Consequently, the vanes were relocated, as in Fig. 4E, to provide equal vertical spacing and a varying distribution along the slot according to

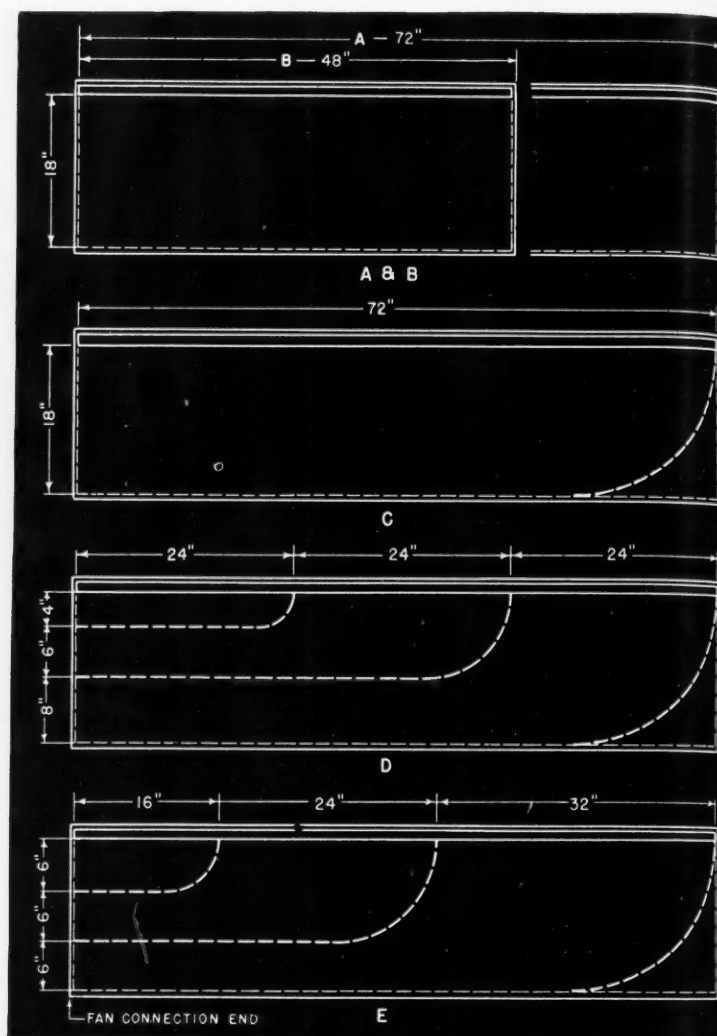


Fig. 4—From top to bottom—A shows usual manifold without vanes (no uniformity of withdrawal); C increased velocity near vane, but did not secure uniformity along slot; D shows three vanes with greatest cross sectional area at farthest out opening—too much air taken out at bottom; E shows vanes equally spaced and reasonably uniform velocity through slot. Compare with Fig. 5.

simple fractional proportions. With the exception of minor disturbances in flow in close proximity to the vanes, this arrangement provides a reasonably uniform slot velocity (Curve E, Fig. 5). Undoubtedly, further investigation would show more desirable vane arrangements, but the practical features—and particularly the simplicity—of Arrangement E recommends it.

"The final design, with the proportions adjusted to require only the simplest design calculations, is shown in Fig. 6. The arrangement shown in Fig. 6 may be employed for manifolds of any reasonable length, provided all dimensions are determined in the proportions shown. For long tanks this requires considerable depth to the manifold. A more compact arrangement for long tanks is given by installing fan connections at both ends of the tank thus making the effective manifold length for each fan one-half the tank length."

IN AMERICA'S SECOND LINE OF DEFENSE



BETHLEHEM GALVANIZED STEEL SHEETS

Here's a phase of America's war effort that gives even the smallest contractor or sheet-metal shop a chance to help. It's an emergency housing project located near a newly expanded plant devoted to war production.

Heating in the houses illustrated is done with individual hand-fired warm-air coal furnaces. A single horizontal warm-air duct in the basement serves all rooms through risers. By skillful layout, three risers furnish air to five rooms on the two floors, a

main riser carrying vents on both floors, while the other two serve one floor each. Vents are strategically located in each of the rooms to feed off the risers with a minimum amount of extra ductwork, thus conserving valuable materials. Cold-air return is through one large vent in the main ground-floor room.

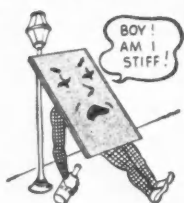
Throughout this entire emergency housing project, as in many another vital phase of America's war effort, Bethlehem Galvanized Steel Sheets were used.

BETHLEHEM STEEL COMPANY

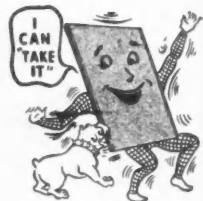


A·R·A SHEETS

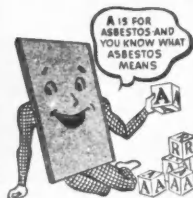
RIGID



TOUGH



FIRE-PROOFED



LIGHT



STRONG

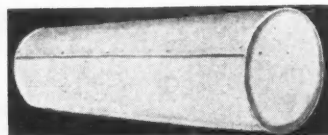


CUTS EASY



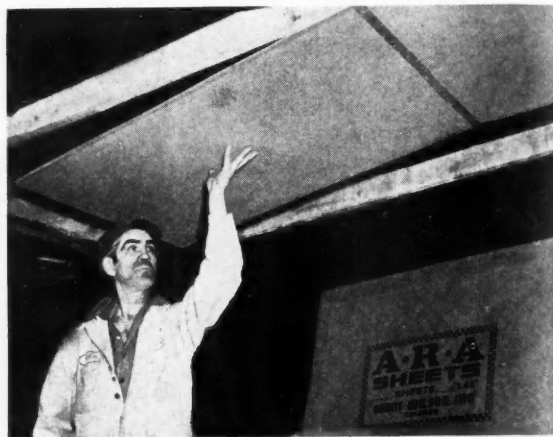
for COLD AIR RETURNS DUCTS and FITTINGS

Don't pass up jobs or delay completion because of critical material restrictions or shortages. A-R-A Sheets are unequalled for closing in joist spaces. A-R-A Sheets are 48" long and made 16 1/2" wide for closing in single joist spaces and are made 33" wide for closing in two joist spaces. They are Asbestos-Protected on both sides, edges are sealed. Get this rigid (but not brittle) sheet that has a high insulating value (K .45 B.t.u.). It's moisture-proofed, light in weight, tough and it cuts and works easily.

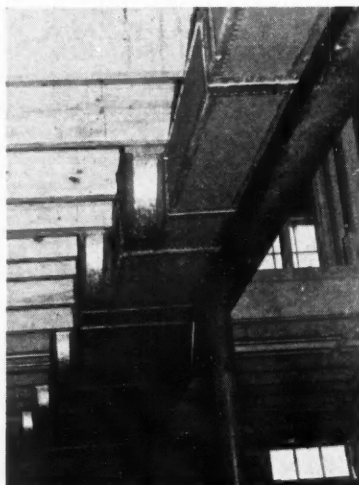


Here is an additional use for A-R-A Sheets. They can be

rolled on your regular equipment into round pipe, fastened with sheet metal screws in the lap or with a "double Pittsburgh lock" seam. You can use a narrow metal inside-sleeve for the joints.



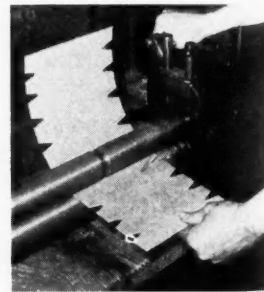
Complete Duct work can be fabricated from A-R-A Sheets reducing the metal needed as much as 98%, depending upon the duct size. You do not need special equipment or tools. Ducts and fittings fabricated out of A-R-A Sheets are firm and rigid. You get a good looking finished job that will really stand up and take abuse. A-R-A Sheets have a Mullen test of over 200 lbs. per square inch. There will be



no metallic rumble or noises from A-R-A fabricated ducts. Here you have a structurally strong duct with good sound deadening properties and in addition a high insulating efficiency. Armour Research Foundation tests show A-R-A Sheets to have an Insulating K factor of .45 B.t.u. Sheet metal screws will "grip" and hold in A-R-A Sheets. These popular sheets can be painted any desirable color.



A-R-A Sheets are designed and built to be worked in the Sheet Metal Shop. They will bend without breaking, they can be rolled, cut, punched, folded, die-cut and still they give you the necessary strength. A-R-A Sheets are air-tight, fireproofed, moisture-proofed and inexpensive.



DUX-SULATION. This is the popular Flexible Insulating material for application on Sheet Metal Duct work. It is applied on the inside of the duct for its high sound absorbing properties. It is applied on the outside of the duct for its high thermal insulating efficiency. DUX-SULATION comes complete with all Accessories for application. Standard roll 36" wide, containing 100 sq. ft., 1/2" thick. Insulating K factor .27 B.t.u.

FLEXIBLE DUCT CONNECTION. This is a woven Asbestos Tape 6" wide, used to make flexible connections in fan and duct lines to absorb vibration. The standard package is 50 lineal feet. Both edges are selvaged to prevent unraveling. Strong and tough. Lasts indefinitely.

GRANT WILSON Inc. CHICAGO

Procedure Under Which FHA

Accepts Substitute Materials

IN this issue we publish a study of current practice in the use of substitute materials in lieu of galvanized iron for the construction of warm air supply and return air ducts in residences.

Letters from readers indicate that contractors have been told FHA *approves* the use of certain substitute materials, but when plans incorporating such substitutes have been submitted to local FHA offices this substitute construction has not always been accepted.

To clear up the misunderstanding, the editors explained the situation to Howard P. Vermilya, Director, Technical Division, FHA. Mr. Vermilya's reply explains how the Washington office and the local offices of FHA cooperate and why acceptance by the local FHA office is the final ruling.

Mr. Vermilya's letter follows:

We would first like to call to your attention that this Administration does not *approve* or *endorse* individual materials. The *acceptability* of any material is judged in the light of appropriate use, service, performance, and compliance with the Minimum Construction Requirements as established for each of our local insuring offices. When requested by any of these local offices we are glad to advise them or investigate for them, any material or equipment which is submitted to them for use in Federal Housing Administration dwellings. Final determination of acceptability is made by our local offices.

Any builder, contractor, or material dealer who wishes to use any substitute materials in a dwelling should submit drawings or samples and all available data including the results of tests, etc., on the material to the local office of the district in which he wishes to use or market the material.

The Technical Division has been studying substitute materials which may be used in lieu of sheet metal, for duct work in warm air heating systems. The information we have secured, together with the result of tests made on some of these materials at the National Bureau of Standards has been submitted to our local offices for their guidance in their determination of acceptability of these materials.

Correct design, materials and installation of duct systems are essential to the fire protection of dwellings. It is, therefore, important that only those materials be used within designated limitations which are incombustible or which do not support combustion.

An exception to this requirement may be permitted for that portion of *return ducts* which are installed in readily accessible underfloor spaces. In this case, the joist spaces may be used as return ducts *up to 6 feet* of the heater, provided the spaces are made tight by use of plywood subflooring above the joists or by lining the top of the joist spaces with heavy asbestos paper stapled or otherwise tightly secured to the sides of the joists and covering the bottom of the joist spaces with sheets of compressed dense composition board, cement-asbestos board, plywood, or similar rigid material.

Within 6 feet of the heater the top, bottom, and sides of the joist spaces are to be fully lined with incombustible materials such as sheet metal or acceptable asbestos boards with rigid connections to heater. Such materials may also be used for the construction of return ducts up to the heating unit provided the duct is made in a secure manner through the use of shop fabricated metal corner connectors and other fittings recommended by the manufacturer.

We note in your letter the statement that our local Chicago Federal Housing Administration office has approved ductboard and board. This is undoubtedly in error since all of our local offices have been instructed not to approve or endorse materials *as such*. Since our work is primarily confined to the insurance of mortgages, the acceptance of materials is judged in the light of their use in the dwelling as a whole and its acceptability as security for the mortgages which we insure. Therefore, you can readily see that a material might be acceptable in some dwellings and yet in others the same materials might not be accepted due to improper installation, etc. In other words the manner in which the material is installed and the type of workmanship obtained is also an important determining factor.

For this reason we respectfully request that you make no statement indicating Federal Housing Administration approval of any specific material by trade name. The need therefore for our established policy in informing only our local offices on the acceptability of specific materials is obvious. This information to our local offices is not to be used for publication since this might be interpreted as Federal Housing Administration *endorsement* of a particular material. When informed of our opinion, final determination of the acceptance of any material must be given by our local offices in accordance with conditions existing and workmanship obtained in connection with each individual job.

Ratio of Fixed to Variable Expenses Should Be Watched in 1942

By Arthur Roberts

"HERE'S one for Ripley," said Harry Lenox, warm air heating dealer and sheet metal contractor. "John Terry runs a business like mine and has the same class of trade. We carry similar lines and get equally profitable prices. In 1940, Terry did \$60,000 in sales. I did \$60,800, so we were neck-and-neck on yearly volume. Our costs and overhead expenses were about the same, so our net profits varied only \$15. In 1941, two large plants in the territory moved away. That hurt local business and Terry's sales dropped to \$50,400, while mine tumbled to \$50,700, so we were still running neck-and-neck in 1941."

"Now, here's the pay-off. In 1940, my net profit was more than John's. In 1941, when we again experienced a similar sales volume, Terry's net profit was \$3,228, my net profit was \$1,137, giving Terry an increase of \$2,091. Can you figure it out?"

Such similarity of figures in the same territory isn't so unusual, neither is a wide variation in net profit between warm air heating dealers and sheet metal contractors with almost identical set-ups and sales. It seldom is brought into sharp focus because comparatively few dealers get to-

gether and compare notes as Lenox and Terry do. However, it brings up an important phase of expense control that every dealer should watch or it may play havoc with profits.

The joker lies in the ratio of fixed to variable expenses. Many dealers think that an expense is an expense and although this is correct insofar as the dollar-for-dollar obligation is concerned, there is a big difference between a fixed expense and a variable expense in its effect on profits when sales swing low. Then a high ratio of fixed expense may make it impossible for the best management to show a satisfactory profit.

Below are comparative statements covering the operating figures of Lenox and Terry for 1940 and 1941. These statements show that the ratio of fixed expenses to variable expenses is an important factor in the successful operation of a warm air heating and sheet metal contracting business.

Notice, that in 1940, Lenox's ratio of fixed to variable expense was 2 to 1, or his fixed expenses were twice as many dollars as his variable expenses, whereas, Terry's ratio was just the opposite. His variable expenses were twice his

HARRY LENOX	
1940	
Sales	\$60,800
Cost of sales.....	36,480
Margin on sales.....	\$24,320
Overhead expenses	
Fixed expense	\$14,180 (2)
Variable expense.....	7,090 (1)
Total overhead expense.....	\$21,270
Net profit on sales.....	\$ 3,050
1941	
Sales	\$50,700
Cost of sales.....	30,420
Margin on sales.....	\$20,280
Overhead expenses	
Fixed expenses	\$14,180
Variable expenses	4,963
Total overhead expense.....	\$19,143
Net profit on sales.....	\$ 1,137

JOHN TERRY	
1940	
Sales	\$60,500
Cost of sales.....	36,300
Margin on sales.....	\$24,200
Overhead expenses	
Fixed expense	\$ 7,055 (1)
Variable expense	14,100 (2)
Total overhead expense.....	\$21,165
Net profit on sales.....	\$ 3,035
1941	
Sales	\$50,400
Cost of sales	30,240
Margin on sales.....	\$20,160
Overhead expenses	
Fixed expenses	\$7,055
Variable expenses	9,877
Total overhead expense.....	\$16,932
Net profit on sales.....	\$ 3,228

fixed expenses, or a variable-to-fixed ratio of 2 to 1. In 1941 Lenox and Terry, sensing the downward trend of sales, began to cut expenses to keep net profits in line. Their fixed expenses were constant and could not be reduced so they had to concentrate on variable expenses: to wit:

HARRY LENOX

Total overhead expense.....	1940.....	\$21,270
Total overhead expense.....	1941.....	19,143

Decrease—30 per cent of \$7,090 variable expense\$2,127

JOHN TERRY

Total overhead expense.....	1940.....	\$21,165
Total overhead expense.....	1941.....	16,932

Decrease 30 per cent of \$14,110 variable expense\$4,233

Both dealers cut their variable expenses 30 per cent, indicating that they were equally efficient with the nippers, but Terry's ratio of variable-to-fixed expense enabled him to use expense control more effectively.

Lenox's proportion of variable expenses was too low. Even though he cut close, his efforts were stymied by the high ratio of fixed expense, which he couldn't cut. Terry, on the other hand, with a bigger field to work in, \$14,110 in variable expenses against Lenox's \$7,090, made a real reduction in this portion of his overhead in 1941 and saved \$4,233. He may have been able to effect some of this economy in 1940, but some dealers and contractors forget their overhead in the years of fat and try to economize only in the years of lean.

Don't Let Fixed Expenses Get Too High

The important thing to remember in this connection is that you should never let your fixed expense get so high in ratio to variable expense that you can't effect satisfactory economies if sales fall off. There are cases where the ratio of fixed to variable expense ran 8 to 1 without serious effect on profits when sales were high, but when sales tumbled, a wipe-out of the entire variable expense, all the reduction it was possible to make, could not prevent an operating loss.

Undue expansion will sometimes skyrocket fixed expenses perilously and explains why some manufacturers are not so keen about expanding these days because the fixed charges that accompany expansion cannot be discarded when sales tailspin. The same holds true for all business enterprises. If you load yourself up too heavily with fixed expenses when business is booming, you may not be able to get out from under when volume resumes a normal trend or dips below normal. This does not mean that you should throttle reasonable expansion, but consider all circumstances carefully before obligating yourself to carry fixed expenses that you can't cut be-

cause they cannot be discarded as readily as variable expenses.

These Are Fixed Expenses

Items usually classified as fixed expenses are:

- Rent
- Depreciation
- Taxes
- Insurance
- Interest on long-term loans and mortgages
- Heat, light, power, water
- Allowance for bad debts

Items usually classified as variable expenses are:

- Salaries of executives, salesmen, other employees
- Bonuses and commissions
- Office expense
- General supplies
- Advertising
- Maintenance and repairs
- Unproductive labor
- Incoming freight, express and cartage
- Legal and accounting services
- Travel, dues, subscriptions, donations
- Telephone and telegraph
- Delivery expense
- Interest on short-term borrowings
- Miscellaneous expense, such as credit report fees, petty cash items, loss on inventory, etc.

There is no standard ratio against which to check your proportion of fixed to variable expenses. In the warm air and sheet metal fields, studies show that the fixed to variable ratio gyrates from 1 to 2½ to 1 to 6. You will naturally ask, "If the ratio varies rather inconsistently with sales and profits, what policy shall I pursue in checking this important factor in expense control?"

How to Check Ratio

A suggestion is—try to maintain a ratio of at least 3 variable to 1 fixed; "eagle-eye" variable expenses at all times to keep them at minimum; refrain from saddling your business with a fixed expense unless you have considered all circumstances carefully; list fixed and variable expenses on your profit and loss statement separately so that the two classifications will stand out in bold relief for comparative study from month to month or period to period. A change in the ratio need not mean disaster, in fact, it may be for betterment, nevertheless, this ratio should be watched and any change probed immediately.

It should not be difficult to make sales during the next year, but it will be hard to salvage profits on the sales made unless you maintain top standards of efficiency on expense control. One way to accomplish this objective is to see that fixed and variable expenses are safely proportioned so that, unlike Harry Lenox, you do not go under with overhead.

Illinois Convention Concentrates on War Era Problems

MEMBERS of the Sheet Metal Contractors Association of Illinois crowded into a two-day meeting, April 8 and 9, in Peoria, a full packed program covering the present situation in the warm air heating field and developments during the past twelve months; also the very latest reports from Washington concerning priorities, limitations, regulations in general.

Two important pieces of business were transacted during the convention. First, the salesmen's auxiliary, which for the past two years has been contributing financially to the support of the convention, but which has not actively participated in the business affairs of the association, were voted into full membership. The second piece of business was the appointment of a committee to investigate the possibilities of Illinois contractors obtaining prime or subcontracts for the fabrication of war materials. The committee will study sub-contract displays in Chicago and will pass along by mail to association members lists of products requiring fabrication, all necessary blanks for contractors to register with local contract distribution offices and with prime contractors and will, if possible, arrange the necessary contacts by which orders are obtained.

Also during the business session, Irving Eichenberger of F. Meyer and Bro. Company, and H. G. Sell of the Sall Mountain Company were elected to the Board of Directors to represent the salesmen's auxiliary. The same officers as were in office in 1941 were re-elected for 1942. As follows:

President J. E. Peterson, Hinsdale
Vice President C. H. Lauerman, Galesburg
Secretary W. W. Johns, Urbana
Treasurer F. I. Eynatten, Peoria
Directors: Joseph J. Walter, Ottawa; Edward Pluth, Lincoln; C. B. Reece, East St. Louis.

The developments of the warm air heating industry during the past twelve months and the present status of the industry were summarized by Prof. S. Konzo of the Engineering Experiment Station, University of Illinois.

Konzo Discusses Today's Problems

For the past year, said Prof. Konzo, about 75 per cent of the association's and of the Research Staff's time has been in the way of government consultation and service. Said Prof. Konzo, "For the past 15 years or more, our industry has fought hard for high-



President Peterson (left) presiding at the business session was re-elected for the coming year. So was Secretary W. W. Johns (right).

er and higher standards of design and installation practice; now we find that we have to definitely lower these standards. As an association, we have actively co-operated with officials and agencies in preparing standards of design and installation for warm air heating systems in army camps. We are greatly concerned to find that at present one out of each three grate bars in these coal-fired furnaces will require replacement during the first twelve months of operation, primarily because of inadequate firing methods.

"As an association, we have suggested to the army that civilian supervisors be appointed for each camp; these supervisors to set up the necessary procedure to insure adequate firing, conservation of fuel, and elimination of the present harmful practices. All we have been able to obtain from army officials is that this scheme sounds quite all right and that interested civilians should apply to the nearest local district engineer's office. Unfortunately, contractors and engineers already applying have found that local engineer's offices do not seem to know what this is all about and they have not succeeded in obtaining any definite assurance of employment.

Fewer Furnaces—Fewer Dealers

"We have been told that the manufacture of furnaces will be reduced to some production figure approaching one-half of the number of furnaces produced in 1940. Manufacturers who produced more than 8,000 furnaces in 1940 will have their production cut 50 per cent; manufacturers who produced less than 8,000 furnaces in 1940 will have their production cut 10 percent. What this will mean in the way of actual number of furnaces produced can not be estimated at present because of the change in metal requirements for the furnaces we now manufacture as compared to the furnaces we used to manufacture.

"It begins to look as though many dealers will have to go out of business. It is expected that if this occurs, it will be the fringe dealers like the coal yard handling furnaces and stokers; or oil-burner agencies selling furnaces; or the very small operator who can make more money working in a war plant than he ever could make operating his own heating business.

"As an industry, we still expect that repairs and

"This NORGE deal is right down our alley~"

"Take it from me, sheet metal and heating contractors have to be on their toes these days! The big volume is in defense housing, and only those who can supply the right automatic heating equipment are able to get this business.

"Lucky for us, we handle Norge warm air units, and they meet any builder's specifications for any type of defense home. The line is the most complete on the market, and it's sold factory-direct to us so we can meet any competition with rock-bottom prices.

"And don't think builders aren't interested in that name, NORGE BORG-WARNER! They know it means that these units are backed up by years of experience in manufacturing oil-fired furnaces. They know Norge wouldn't consider putting its name on anything but

the most efficient, highest quality heating plants that can be made for these low-cost homes.

"I understand that certain Norge territory franchises are still avail-

able. To get your share of these new defense contracts, and to keep your own business moving ahead, write Norge for facts today."

NORGE HEATING and CONDITIONING DIVISION BORG-WARNER CORPORATION

12345 KERCHEVAL AVE.

DETROIT, MICHIGAN



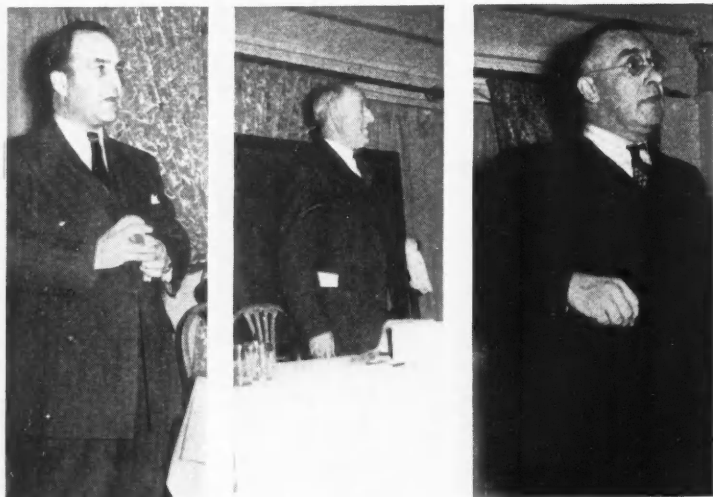
NORGE OIL HEATING UNIT OD-70

A streamlined forced air unit for utility room or closet. Takes only 26 in. sq. floor space! Comes factory-assembled and factory-wired for quick, money-saving installation.

Approved for all U. S. specifications. Beautiful pearl-gray baked enamel finish. Seven other Norge Oil Furnaces. Write for specifications.



See **NORGE**
Before You Buy



M. N. Johnston, from the Washington Office of WPB, explained how priorities came about and what we may expect. William Ogden, center, of Peoria WPB, took P-84 apart and analysed it to the tune of dozens of questions. M. W. Haag of the Peoria Office of Contract Distribution couldn't hold out much hope for sheet metal work.

replacements will be considered essential; we can not see where Washington will eliminate material for repairs and replacements because if Washington does this, American home owners will be cold next winter. What the volume of repair and replacement will be is highly uncertain.

80,000 Btu Will Be Our Biggest Furnace

"The much publicised Critical Materials List announced by War Production Board is in effect a code of installation practices. Certain materials are completely eliminated; substitute materials are acceptable within certain limitations; but the most important feature has not been properly publicised. This most important feature is the fact that the capacity of the furnace which will be permitted to be installed in a given house shall not exceed 66 times the square feet of floor area or 80,000 Btu total heat loss, whichever is the smaller. As an example, if a house measures 30 by 30 feet, or a total of 900 square feet, we multiply 900 by 66 to obtain 59,400 Btu, which means a 60,000 Btu capacity at the register furnace. If the heat loss of the house is more than 60,000 Btu, the builder must insulate the house down to a 60,000 Btu heat loss. Since many of these small defense houses now being constructed measure less than 30 by 30 feet on the ground, it becomes apparent that the 60,000 Btu furnace is likely to be the average furnace installed in 1942. At the same time, many of these small houses have a heat loss higher than 60,000 Btu, so most of these houses will have to be insulated. It seems to me that the logical thing for the heating contractor to do is to take on the agency for a line of insulation.

"The builder of the house must submit to FHA a set of floor plans and a heat loss. Most of these builders are unable to figure heat loss so it seems that the furnace installer will be asked to calculate the heat loss for the builder. If the furnace man calculates the heat loss and finds the house heat loss exceeds the capacity of the furnace, he is permitted to install, then why not sell the builder insulation as a part of the heating service.

"If the Critical Material List is interpreted literally, the manufacturer will have to furnish an infinite range of furnaces in 1,000 Btu capacity increments in order to meet all of the sizes required, or many furnaces will be 10,000 Btu under the heat loss of the house, requiring the builder to insulate the house down to the capacity of the furnace."

Two Combustion Rates for Rating

"The Association has suggested an alternative, which has not been approved at the time of this meeting. This alternative is that furnaces shall be rated by the manufacturer at two different combustion rates. To illustrate—the Standard Gravity Code rates the furnace at a 7½-pound combustion rate. Supposing that a given furnace at a 7½-pound combustion rate produces 60,000 Btu. Our suggestion is that the same furnace carry a second rating at a 5-pound combustion rate, or a capacity of approximately 43,000 Btu. We know from tests that a furnace is equally efficient at 5-pound combustion rate as at 7½-pound combustion rate all conditions being equal. If this suggestion is adopted, it will mean that a given furnace can be used for a range of heat losses approximately 20,000 Btu in scope. A manufacturer will thereby be able to produce perhaps three furnaces to meet the requirements of all the houses to be built in 1942. We have not suggested ratings at combustion rate under 5-pounds because there is some danger of poor combustion under 5-pound rate."

Prof. Konzo then explained briefly how the Critical Material List establishes certain methods of rating furnaces, based upon standard gravity square inches of leader pipe ratings by the manufacturer. The critical materials list has been published in the March issue of American Artisan and this rating feature of the list was emphasized in March. Roughly the square inches of gravity leader pipe capacity multiplied by 136 times a factor set for the type of fuel or type of furnace gives the converted rating at the register. Prof. Konzo also explained how the gravity installation manual simplifies heat loss calculation and also engineering design by making it possible for the contractor to select heat losses directly from precalculated tables and from the register size to also select the size of the stack, branch and main required to serve that register. Prof. Konzo said the gravity code manual is accepted by the housing agencies in Washington, so that a contractor need not hesitate to use this method of engineering.

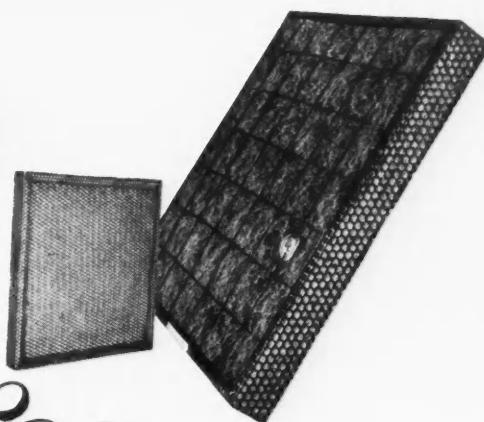
The Reasons for Priorities

From the very heart of Washington's War Production Board, Plumbing & Heating Division, came M. N. Johnston, to present a resume of priorities and the present status of critical materials. Mr. Johnston's summary of the situation clarified many points which heretofore have been confusing to the industry. For example, it is difficult for many contractors to understand why there should be such a pressing scarcity of galvanized iron sheet and light gauge plate. Mr. Johnston explained that the scarcities of metals, particularly steel, has become even worse than anyone realized or appreciated. In the beginning, there seemed to be plenty of materials, but our production requirements for war items has increased so tremendously that no one in the beginning could possibly visualize the demand for all metals which has since arisen. Since our war item production is increasing by leaps and bounds, thereby requiring more and more metal, there seems to be very little hope for the average civilian or contractor user to obtain sheets and light gauge plate as he wants until after the war is over.

Some other materials like copper, stainless steel or zinc, and many of the alloy materials which this industry has been accustomed to use, have become so scarce that it is impossible to even expect the contracting industry to secure a single pound of these

HERE'S HOW

Tampico



..... HELPS THE WAR EFFORT!

1. Tampico conserves materials by using its all-steel frames over and over again (see below).

2. Because Tampico does a good filtering job, it helps promote better health through cleaner air.

..... HELPS YOU!

1. Tampico Filters are EASY TO SELL because their superiorities are EASY TO SEE. Compare a Tampico with any other filter—side by side—and you'll see what we mean.

2. You make an additional \$7.20 extra profit per gross on Tampico Filters because we buy back used frames from you at 5c each.

..... HELPS YOUR CUSTOMER!

1. Tampico does a better filtering job, right from the time it's installed, because of: (1), the "nature" of its filtering element (Tampico Fibre), (2), the exclusive processing and flame-proofing this Fibre receives and (3), the uniform density with which filter frames are filled.

2. Tampico KEEPS ON doing a better job OVER A LONGER PERIOD because its all-steel frame will stand repeated tappings or cleanings—ultimate dirt clogging is postponed—filtering life is s-t-r-e-t-c-h-e-d.

Send the Coupon

See for yourself why more and more Dealers are choosing Tampico as the outstanding filter in the "throw-away" field.



Chicago Filter Co.,
Joliet, Ill.
Gentlemen: I'm willing to look. Send me a free sample Tampico Filter.

Name

Address State

City

TAMPICO FILTERS

"The World's Largest Exclusive Air Filter Manufacturers"

materials until the war is over.

Mr. Johnston also explained that many of the materials which never were used in large quantities and which contractors figured could be used as substitutes are now too scarce to obtain because when used as substitutes the supply of these materials was quickly exhausted. For instance, lead has always been a drug on the market, but because other materials were unobtainable, lead has been substituted and now lead is getting scarce. Zinc is in much the same category as lead.

What We Can Look Forward To

As to what this industry may expect, Mr. Johnston said every industry should be prepared insofar as possible for the worst possible contingencies. Most persons in an industry consider the worst possible contingency to be the complete closing down of that industry in accustomed activities. The washing machine industry, the radio industry, the automobile industry have been converted 100 percent to war. This 100 percent conversion is quite likely to be applied to many other industries as time goes on. Industries which are not wholly converted will, of course, be greatly curtailed in ordinary activities, but the degree of this curtailment is impossible to forecast and what right now may look like a safe bet may within the next three or six months be a wholly converted industry. As to what the warm air heating and sheet metal industry can expect in the way of conversion, Mr. Johnston said he did not believe anyone could forecast.

An open forum discussion of current problems was staged following Prof. Konzo's report. The committee of "experts" was Prof. Konzo, M. H. Johnston of Washington, J. D. Wilder, American Artisan, and B. F. Lagerborg of Premier Furnace Company, Dowagiac. The questions presented to these "experts" ranged far and wide and included many questions on heating design and installation; what contractors can do with stocks of gas furnaces or stainless steel in their shops; does repair mean what it says or does it mean

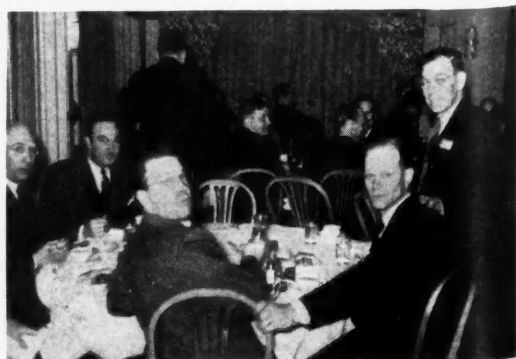
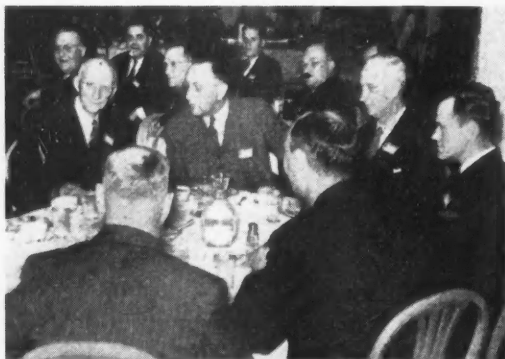
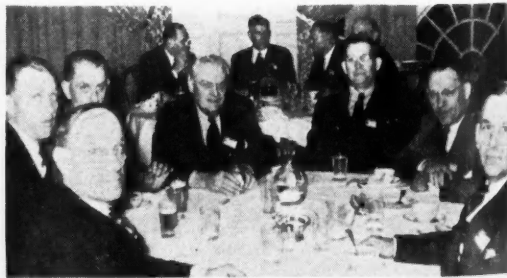
betterment; what expectation is there for the contractor to remain in business; and many others. No full report was taken of the question and answers so we regret that we can not publish information here.

Sub-contract Contracts

M. W. Haag of the Peoria Office, War Production Board, summarizing the subcontract distribution picture, pointed out that if the hopeful fabricator sticks strictly to the items which have always been fabricated in sheet metal, the applicant is likely to find the number of items awaiting manufacture greatly limited. What every hopeful applicant should keep in mind is that ingenuity is desired; it is hoped that potential fabricators can visualize many items they can fabricate in sheet metal which heretofore have been machined or cast or stamped or fabricated by some other means.

Mr. Haag said there are already many examples of this ingenuity, and the only way in which a potential fabricator can find out what he can make is to visit all possible displays and offices and discuss his possibilities with everyone he can contact. It was of considerable interest to hear Mr. Haag state that bids are not being taken competitively today, but are being let on the basis of ability to produce and perform. The program today has reached the pace where every possible small manufacturer must be used in the production of war items. War Production Board will now talk contracts on a negotiated price basis; the potential manufacturer will be given a pilot order and close tract will be kept of costs. If the fabricator can produce up to requirements, he will then be given as large an order as he can handle without any competitive bidding. *The editors of American Artisan have not yet heard of any such negotiated contract in the sheet metal fabricating field.*

Mr. Haag said the subcontracts from prime manufacturers are probably easier to get than prime contracts direct from the government or from the War Department, Quartermaster Department, or any of
(Continued on page 102)



Lots of fun and play in the Illinois' manner. Informal pictures of table groups preceeding the floor show (center). We call especial attention to the picture lower, left—George Harms (facing the camera) added the final homecoming touch to the convention.

Where trustworthy tools are vital



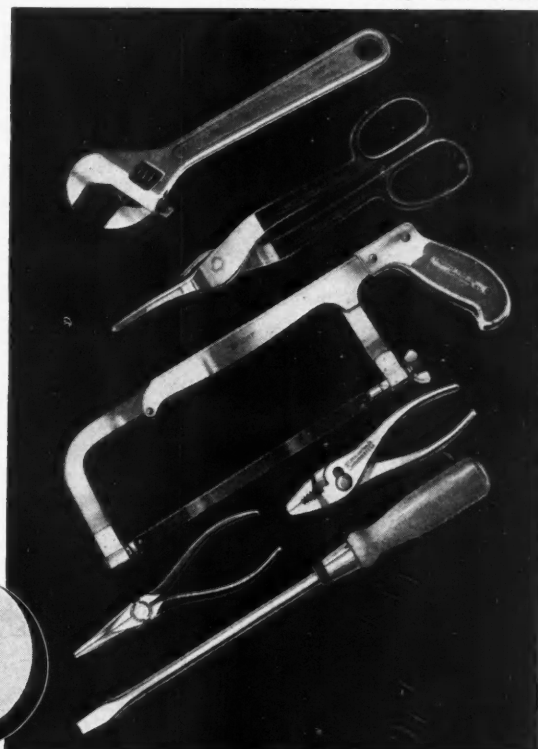
(Photo by U. S. Army Signal Corps)

This is more than a Machine War. It is a war of Tools as well. The first job, of course, is to build the machines. But to "keep 'em rolling" they must be serviced efficiently and quickly. That means trained tools as well as trained men. Today thousands upon thousands of Crescent Tools are being used by our Army, Navy and Marine Corps to do this vital job—they go with our men wherever they go.

Crescent Tools include adjustable wrenches, pliers of all types, hacksaws, snips, screwdrivers, etc., etc. They are sold under the "Crescent" and "Crestoloy" trade names by hardware and industrial distributors everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

CRESCENT TOOLS
Give Wings to Work



Association ACTIVITIES

National June Convention

The National Warm Air Heating and Air Conditioning Association's semi-annual convention and conference will be held at the Stevens Hotel in Chicago on Tuesday, June 9 and the association cordially invites manufacturers, jobbers and dealers of the warm air heating industry to attend. Primarily the program has been arranged to give manufacturers information in connection with present day problems. In addition, there will be much of general interest for both jobbers and dealers. For the promotion of the war effort and for protection of manufacturers' interests, a solid front and common understanding among manufacturers is most necessary.

On Tuesday morning, June 9, the subjects to be covered will be of a general nature, but tied into the plans for our industry, both present and future. On the afternoon of June 9, the entire afternoon will be devoted to hearing speakers on war conversion and in addition an hour or more for informal discussion, questions and answers.

At the morning session, association president H. S. Sharp will open the program.

P. M. Zimmerman, newly appointed chairman of the association's Publicity and Merchandising Committee and vice-president of the Airtemp Division of Chrysler Motors, will speak on "Tomorrow—Not Today."

W. L. McGrath, member Plumbing and Heating Industry Advisory Committee to the War Production Board and general manager and vice-president of Williamson Heater Company, will give his impressions of our industry as he sees it today.

F. G. Sedgwick, chairman of our Research Advisory Committee; W. D. Redrup, chairman of our Installation Codes Committee; and Professor S. Konzo will report. Following Prof. Konzo, W. Walter Timmis, Chief, Plumbing and Heating Branch, War Production Board; David H. Butler, Chief of the Heating Section for the Branch; and Morgan N. Johnson, Administrator of Limitation Order L-22 for the Branch; will appear on the convention program. They will give us information regarding various orders, and will do their best to answer many of the perplexing questions which have arisen.

Frank E. Mehrings, association 2nd vice-president and vice-president of Meyer Furnace Co., is the luncheon chairman. Guest speaker will be Cy. T. Burg, general sales manager Iron Fireman Mfg. Co., who will talk on "The Golden Touch."

H. P. Mueller, association 1st vice-president and president of L. J. Mueller Furnace Company is chairman of the afternoon session. T. I. Byrd of the American Rolling Mill Company is the first speaker, followed by Tom Johnson, metallurgist of the Republic Steel Corporation, who in turn will be followed by a representative of the Carnegie-Illinois Steel Corporation; all of whom have had a wide experience in connection with conversion of various types of manufacture to war work.

Following talks by steel manufacturer representatives, Lorin W. Smith, Jr., chief of the Conversion Section of the Plumbing and Heating Branch of the War Production Board, Washington, will give the benefit of his wide experience covering conversion to war work. Following Mr. Smith, Lieutenant-Colonel G. M. Pike will talk on "Conversion to War Work from the War Department's Point of View." Lieutenant-Colonel Pike is connected with the Facilities Branch, Resources Div., War Department,

Washington, D. C. Following Mr. Pike's talk, the convention will be thrown open for informal discussion and questions on "Conversion to War Work." At 6 p. m., there will be an informal reception and cocktail hour at the Stevens Hotel.

On Wednesday, June 10, the Chicago Convention Committee has made arrangements with a private golf club so that those who wish to play golf may do so.

Managing Director George Boeddener says the morning and afternoon programs will be dripping with information to assist in current industry problems. Manufacturers, jobbers and dealers are urged to make their room reservations now. Single rates from \$3.25 to \$7.00. Double rates from \$4.75 to \$9.00.

George Boeddener, Man. Dir.

NWAH&ACA Summer Meeting

The Chicago Convention Committee for the National Warm Air Heating and Air Conditioning Association's summer meeting in Chicago, Stevens Hotel, June 9, has been formulating plans for the entertainment of those who attend. Headed by T. Reid Mackin, J. Harvey Manny and Ralph Blanchard, this committee has appointed Grant V. Wilson as chairman of entertainment, J. Harry Ebbert as treasurer and chairman of golf, Hugh Courteol as chairman of publicity and finances, and Ed Carter as secretary.

A cocktail party will be held at the conclusion of the one-day meeting on Tuesday, the ninth. Facilities for golf will be reserved for those who wish to stay over the following day, June 10.

Milwaukee

The announcement of the May 4 meeting of the Milwaukee Sheet Metal Contractors Association, Inc., is accompanied by the Weekly Bulletin of the Wisconsin Manufacturers Association reproducing a memorandum issued by General L. B. Hershey, director of the National Selective Service System. The memorandum calls attention to the responsibility of the system to select men for military service and for retention in their civilian endeavor an adequate supply of trained, qualified, or skilled men in order to maintain those civilian activities necessary to war production. The occupational classification policy is covered, as well as civilian activities; critical occupations; shortages of trained, qualified or skilled men.

A sales exchange list also accompanies the bulletin, and lists equipment wanted, for sale, and help wanted.

The meeting notice also announces that the War Production Board asks every employer to cooperate with the Salvage Division in the campaign to comb Wisconsin for critical materials. On April 24th, D. Gee and T. du Pont III, who have charge of the Central States, enlightened those present at the Pfister Hotel as to everyone's duties. The suggestions were

- 1—Put some individual in charge of salvage throughout all departments and give him authority to act.
- 2—Devise an effective method of bringing the message of conservation to all of your employees.
- 3—Built into your plan a program to keep it alive. Don't let initial enthusiasm die.
- 4—Act now.
- 5—Time is valuable; make this request your paramount job to help us get the scrap.

Paul L. Biersach, Secretary.



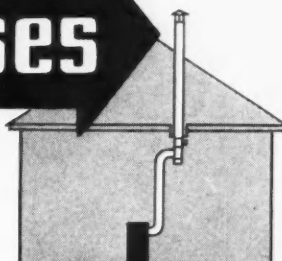
VITROLINER

for **VICTORY** in low cost

Defense Houses

a Complete Venting System

Vitroliner is in the War Effort 100% with a complete chimney especially designed for defense houses. Vitroliner chimneys are practical and have been proven highly successful in thousands of defense houses throughout the country. Vitroliner is the answer to the chimney problem, due to its adaptability to all types of heating—oil, gas, or coal. Years of research and development have produced in Vitroliner a superior, more dependable, uniform chimney than was ever before thought possible. Quickly assembled on the job by average workmen, fool-proof in construction, Vitroliner is the practical way multiple construction can be accomplished in minimum time. The use of Vitroliner brings long life, superior draft, stable uniform corrosion-proof, vitreous enamel construction. Vitroliner has been used and accepted on numerous government defense housing projects.

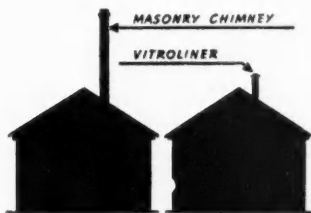


The Vitroliner Chimney can be suspended from the ceiling joists, or special wall bracket thus requiring no floor support or space.

VITROLINER Revolutionizes Chimney Construction

Superior in every detail, Vitroliner eliminates all the objectionable features of the old common brick chimney. It requires less than one-half the space of a masonry chimney, and has very little weight. Vitroliner gives superior draft, and is fully insulated. Can be installed in any part of the defense house, and can be demounted at any time.

Vitroliner is constructed to prevent leakage and damage to the roof flashing, by special patented features which allows for expansion and contraction of flue, due to extreme temperature conditions.



Vitroliner consists of lengths of acid-resisting vitreous-enamel-coated Armco ingot iron pipe and fittings which are insulated with a high-temperature prefabricated asbestos insulating wall one inch thick.

VITROLINER PIPE — a heavy-gauge, high-quality, welded-seam Armco metal, coated inside and out with a special high-temperature, acid-resisting vitreous enamel. The pipe is made in stock sizes from 3" to 10" in diameter, bell and spigot joints of 6", 12", and 24" over all standard lengths; 22½°, 45°, and 90° elbows and open or closed tees with drain provision. All pipe and fittings have a 2½" lap joint.

Our DRAFT TESTS prove Vitroliner Chimneys will produce more than twice as much draft as a brick chimney of the same height.

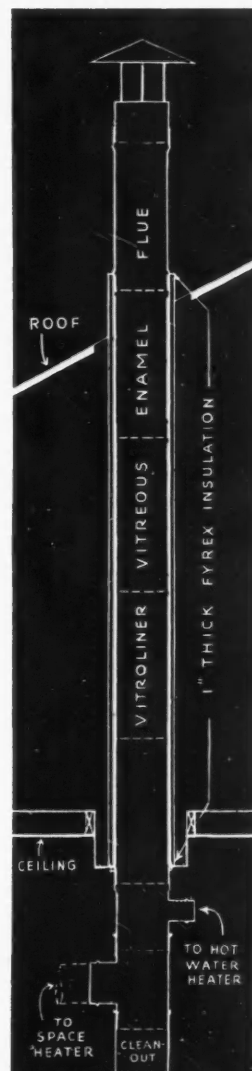
A 6" diameter Vitroliner flue only 12' high will produce a draft of .09 inches with 400 degree flue gas temperature. To obtain the same draft under identical conditions, an 8" square masonry chimney must exceed 27' in height. In order to obtain .09 W.G. inch draft, it is only necessary to have a 400 degree stack temperature with a 12' high Vitroliner chimney. In order to obtain .09 W.G. inch draft, it is necessary to have a 1000 degree temperature in a 12' high masonry chimney.

WRITE FOR OUR SPECIAL DEFENSE HOUSE CIRCULAR



**CONDENSATION
ENGINEERING
CORPORATION**

2515 ARCHER AVENUE • CHICAGO, ILL. • PHONE CALUMET 4362
14 YEARS DEVOTED TO THE DEVELOPMENT OF CHIMNEY VENTS



Special Features

1. Quick, easy installation.
2. Space-saving, durable.
3. Uniform construction — die formed joints.
4. Manufactured of Highest Quality Materials.
5. Superior draft (double the draft of common brick chimney).
6. Demountable construction.
7. Fyrex insulated.
8. Expansion and contraction feature.
9. 14 years of Practical Experience in the field.
10. Covered by exclusive patents.

New PRODUCTS

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 91 and mail to us.

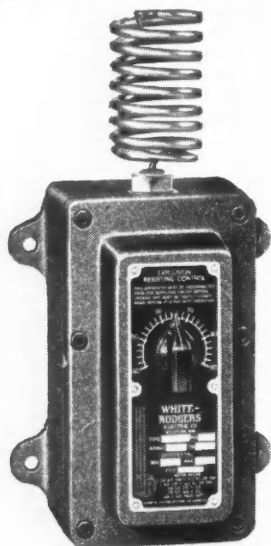
● Indicates product not listed in 1941 Directory.

△ Indicates manufacturer not listed in 1941 Directory.

50—Explosion-Proof Thermostats

White-Rodgers Electric Company, 1209 Cass Avenue, St. Louis, offers new explosion-proof thermostats, approved by Underwriters' Laboratories, for heating, refrigerating and air-conditioning installations where hazardous conditions exist.

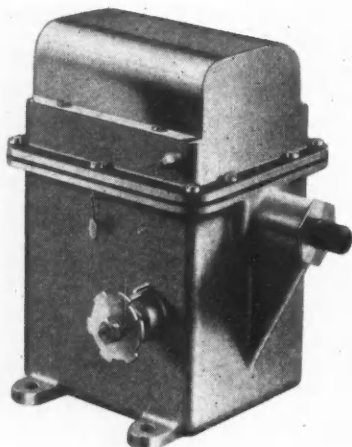
The thermostats are line voltage, Hydraulic-Action controls especially



recommended for use in oil refineries, munitions plants, cleaning plants and similar locations. Both self-contained and remote type controls in standard ranges are available.

51—Microtrol

Barber-Colman Company, Rockford, Illinois, announces the Microtrol for operating butterfly valves, multiple ratio fuel valves, and regulation of dampers.



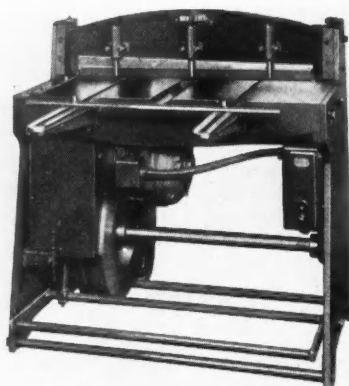
Features are a high torque proportioning control motor with built-in limit switches and potential dividing rheostat. Output shaft is driven

by company's shaded pole induction motor through gear reduction of machine cut, heat-treated gears.

52—Power Squaring Shear

Whitney Metal Tool Company, Rockford, Illinois, has recently developed a new power squaring shear—Series No. 72—made in 36 and 42 inch cuttings lengths, 14 and 16-gauge capacities. The blade adjustment is simple, accurate and positive.

Crosshead is steel fabricated with truss support. Shear blades are inlaid high carbon steel. Special shear blades can be furnished. Lower shear



blade is adjusted by means of a tapered wedge, located directly below the lower shear blade. Table is semi-steel cast normalized, provided with "T" slots for holding gages and extended arm supports for holding gages. Holdown is the spring plunger type, entirely concealed. Backgage is assembled to the crosshead, and can be arranged in a parallel position as well as at an angle in relation to the shear blades. Housings are steel fabricated and are securely dowed to the bed plate. Connecting rods are fabricated of steel with bronze bushings. Clutch is plunger pin type, three contact, heat treated bushing pressed into fly-wheel to receive recoil pin wear.

53—Metal Lead Primer

The Midland Paint & Varnish Company, Cleveland, Ohio, offers a metal lead primer with metallic non-rusting components.

Hyspar Metal Lead Primer may be brushed, sprayed or dipped and dries hard in 4 to 5 hours. Color is neutral grey.

Hyspar Metal Lead Primer is available in two forms—in large quantities already mixed for application, or in separator cans with the metal paste separate from the liquid.

54—War Housing Units

American Radiator & Standard Sanitary Corporation, Box 1226, Pittsburgh, Pa., announces several new Sunbeam warm air products designed to meet government specifications for war housing. These units meet the heating demands and cost requirements of practically any type of war home, with or without basements. Two of these are:



The Maumee winter air conditioner (illustrated) is a coal-fired model, with an efficient steel heating element, with all joints welded. A cast iron baffle at smoke outlet helps prevent heat loss up the flue. Specifications include: ample firebox, lined with refractory brick; rocker type grates, with combination shaking and dumping features; quiet, double inlet type blower with self-aligning bearing sockets, located underneath and enclosed within jacket; blower motor of ample capacity is equipped with overload protective device. Floor space occupied—24 x 26 in., capacity at bonnet—69,300 Btu., air volume (cfm range) 600-950. Unit is shipped partially assembled.

The Dundee winter air conditioner is a coal-fired model of practically same construction and design as the Maumee, except that blower cabinet is separate and attached to rear or either side of jacket. Capacity and air volume is the same as the Maumee. Space occupied—25 x 25 in., plus 18½ in. on side where blower cabinet is located.

55—Cornice Block

Ludowici-Celadon Company, 104 S. Michigan Ave., Chicago, announces a new development in an interlocking gravel stop—cornice block—as a substitute for metal in flat roofing work.

This Practical **FORCED AIR HEATING DESIGNING MANUAL**

Only \$1.00

This enlarged, second edition of **FORCED AIR HEATING** reduces the task of designing forced air heating systems to a simple, easy-to-follow procedure. Four reasons why contractors will find this book unusually helpful—a real time and money saver in forced air work—are these:

First—It contains every kind of information needed for designing forced air heating systems quickly and correctly, including a new "mistake-proof" data sheet, the newest tables, charts, and formulas and other essential data developed by outstanding engineers and research bodies.

Second—It outlines for you, step by step, a suggested designing procedure which you can follow in planning any job in quick time, and yet with assurance that the finished installation will perform according to specifications.

Third—It shows you shorter and easier, but thoroughly dependable methods of calculating heat losses, sizing apparatus, selecting register air temperatures, figuring pressure losses, and determining correctly all other factors that must be considered in planning a forced air heating system.

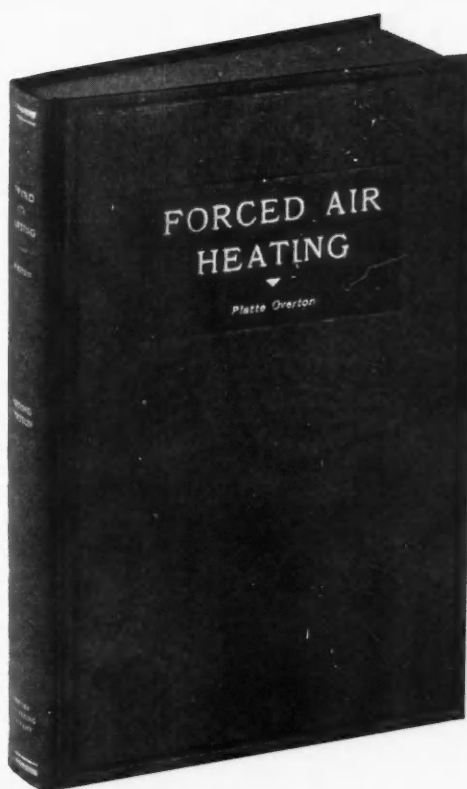
Fourth—It gives you sufficient practical information on all phases of forced air work to equip you to work out readily and correctly any unusual designing problems you may encounter on your different jobs.

FORCED AIR HEATING'S primary object is to show you how your designing problems can be speeded up and simplified. The methods this book recommends are a safe balance between the theoretically perfect procedures which require an excessive amount of time, and the haphazard methods which so often result in costly omissions or mistakes. They are procedures which have been proved completely reliable, as well as important time-savers, through successful application to many hundreds of forced air jobs of all sizes and complications.

WRITTEN IN PLAIN LANGUAGE

Every thought and device to make this second edition a practical, every-day guide to better and more rapid procedure in forced air heating design work has been included in it. It is written in the plainest possible language, and filled with illustrations and concrete examples that make each recommended procedure easy to understand and to apply.

Improve and speed up your designing methods—equip yourself to do more and better forced air work—by sending \$1.00 today to the address below for a copy of **FORCED AIR HEATING**.



215 Pages—6"x9"—Cloth Bound—Illustrated
\$1.00

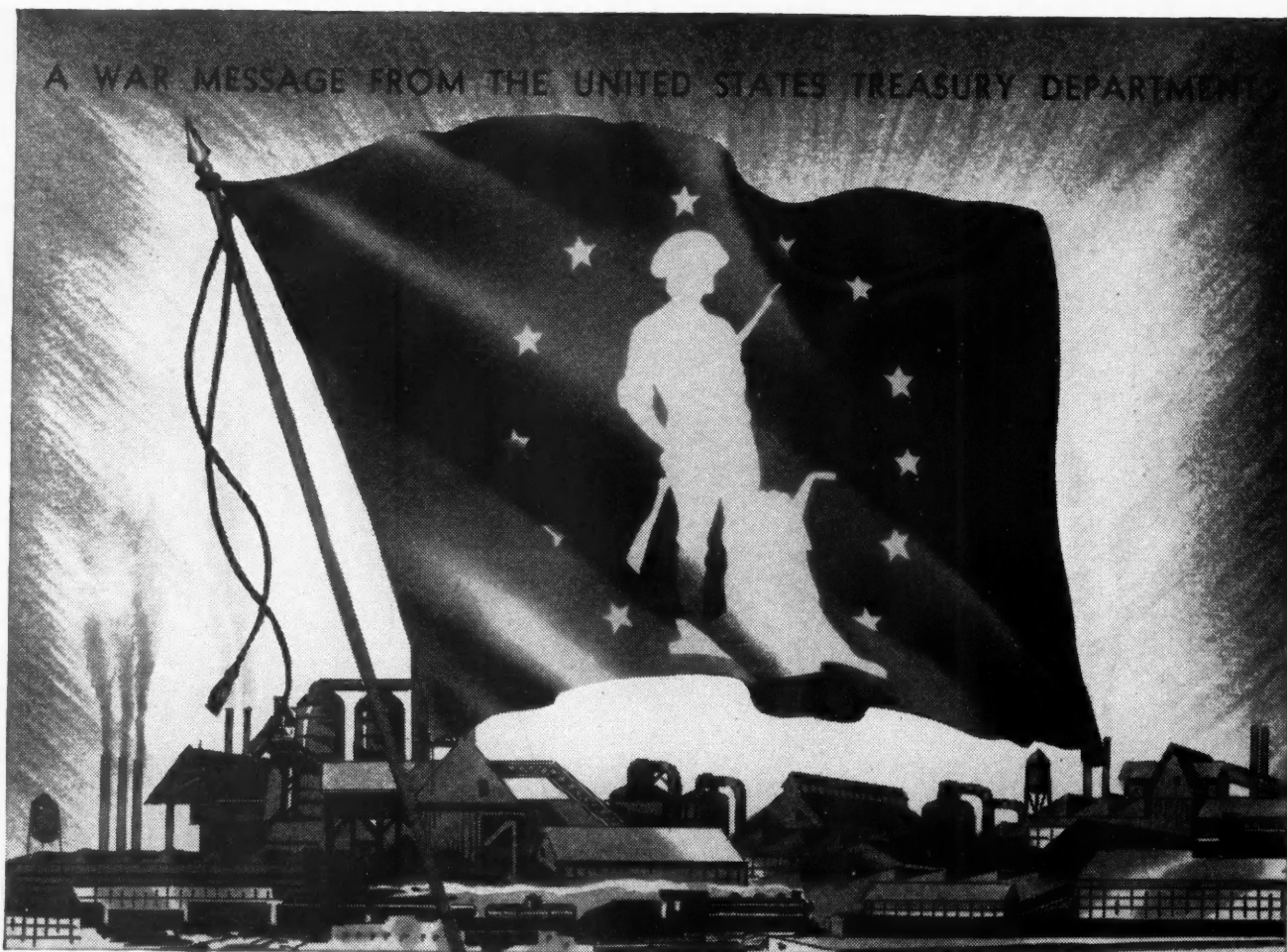
CHAPTER HEADINGS

- A Suggested Data Sheet
- Procedure of Design
- Sizing the Apparatus
- Infiltration
- Registers and Returns
- Multiple Registers
- Return Air System
- Selecting Register Temperatures
- Temperature Drop in Ducts
- Mechanical Code for Forced Air Heating
- Sizing Ducts by Friction Chart Method
- Sizing Extra Long Runs
- Pressure Losses
- Velocities
- Proportioning Losses in Heating Systems
- Branch Take Offs
- Volume Dampers
- Bonnets and Plenums
- Casing Baffling
- Chimneys and Drafts
- Air Conditioning Radiator Heated Houses
- Automatic Control
- Contract and Specifications
- The Index

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AS PROUD A FLAG AS INDUSTRY CAN FLY

Signifying 90 Percent or More Employee Participation in the Pay-Roll Savings Plan

IT doesn't go into the smoke of battle, but wherever you see this flag you know that it spells Victory for our boys on the fighting fronts. To everyone, it means that the firm which flies it has attained 90 percent or more employee participation in the Pay-Roll Savings Plan . . . that their employees are turning a part of their earnings into tanks and planes and guns *regularly*, every pay day, through the systematic purchase of U. S. War Bonds.

You don't need to be engaged in war production activity to fly this flag. Any patriotic firm can qualify and make a vital contribution to Victory by making the Pay-Roll Savings Plan available to its employees, and by securing 90 percent or more employee participation. Then notify your State Defense Savings Staff Administrator that

you have reached the goal. He will tell you how you may obtain your flag.

If your firm has already installed the Pay-Roll Savings Plan, now is the time to increase your efforts: (1) To secure wider participation and reach the 90-percent goal; (2) to encourage employees to increase their allotments until 10 percent or more of your gross pay roll is subscribed for Bonds. "Token" allotments will not win this war any more than "token" resistance will keep our enemies from our shores, our homes. If your firm has yet to install the Plan, remember, **TIME IS SHORT.**

Write or wire for full facts and literature on installing your Pay-Roll Savings Plan now. Address Treasury Department, Section D, 709 12th St., NW., Washington, D. C.

Make Every Pay Day "Bond Day"



U. S. WAR Bonds ★ Stamps

This Space is a Contribution to Victory by American Artisan

U. S. GOVERNMENT PRINTING OFFICE 16-27879-1

Form No. DSS-BP-4

New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on page. 91.

234—Metal Duplicating Without Dies

O'Neil-Irwin Manufacturing Company, Minneapolis, is distributing Catalog No. 42-1—32 pages—covering the DI-ACRO system of metal duplicating without dies. The DI-ACRO benders, brakes, and shears described are simply the means of putting the system into operation.

235—Dri-Air

Tamms Silica Company, 228 North LaSalle St., Chicago, is distributing an envelope stuffer covering their Dri-Air chemical powder and Dri-Air container, for basements, closets, vaults, laundry rooms, photo dark rooms, etc.

236—Defense Sampler Pre-Finished Metals

American Nickeloid Company, Peru, Illinois, has prepared a "defense sampler," which contains samples of their plated metals, with typical uses for them, and charts how they can help conserve more strategic metals for vital war production.

Copies are available to readers bidding on government contracts.

237—Spincraft

Milwaukee Metal Spinning Company, 1325 South 43rd St., Milwaukee, Wisconsin, with branches in Detroit, Cleveland, Buffalo and Boston, offers "A Challenge to American Initiative in a Wartime Emergency." They say "This is no time for 'Gripes,' but come to 'Grips' with the problem." They call on small plants for abilities, facilities and skills to relieve greater factories of many of the parts that go to make weapons of war. Some place, somewhere, a prime contractor needs the facilities you possess, says T. J. Salow, Jr., General Manager.

238—Centrifugal Fan and Blower Standards

National Association of Fan Manufacturers, 5-208 General Motors Building, Detroit, offers the third edition of Form X-12, "Standard Methods Adopted for Centrifugal Fans and Blowers."

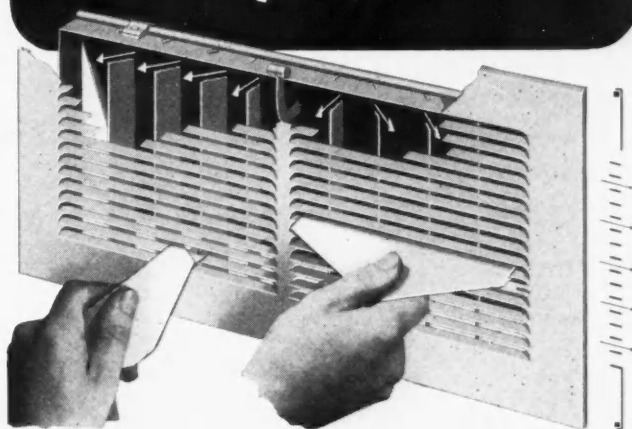
The new form embodying the established working data of the Association has been completely revised and rearranged. There is included standards for Multiblade and Non-Overloading types of fans, air density ratios at various altitudes and air temperatures for use with the chart on Classes of Fans, typical specifications, abrasion, field tests of fans, and comparison charts for Industrial Exhausters and Cast Iron Volume Fans. A tabulation of fan sizes for Multiblade and Non-Overloading fans together with minimum recommended gauges of steel for side and scroll, Class I design, is again included but revised on the basis of the new standards.

239—Catalog No. 51

General Controls Co., 801 Allen Avenue, Glendale, California, offers a new 48-page catalog showing their complete line of regulators, control systems, and solenoid valves. Several new products are introduced for the first time, including small commercial size motor operated valves, new 3-way magnetic lever valves, sensitive D. C. relays, and the new type PV Series electric magnetic valves for airplanes, machine tools, trucks, tractors, buses, and hydraulic systems.

Profusely illustrated with photographs, reproduced blueprints, and cross sectional drawings, this new catalog contains complete tabulated specifications and list prices on all items. It is a comprehensive reference for all engineers interested in pressure, temperature and flow controls for gas, air, oil, steam, etc.

INDEPENDENT *Air Conditioning Registers*



No. 439 Meets Every Requirement FOR DEFENSE HOUSES

This improved register affords the widest latitude in deflecting air flows four ways. Valve opens complete 90 degrees to admit full flow of air from horizontal air duct. Simple, modern design conserves material and presents handsome appearance. And equally important, it is moderately priced to give big value. Made in sizes to meet all standard requirements. Send for catalog.



HORIZONTAL GRILLE BARS, formed in the wrought steel face, are set to deflect air flow about 15 degrees downward. Being flexible, they may be bent, before or after installing, to direct the air flow to any other angle upward or downward, or straight outward.

VERTICAL DEFLECTING VANES attached to the back of the register face direct the air flow straight outward in the center, 30 degrees right and 30 degrees left—the arrangement required for most installations.

These deflecting vanes also are flexible and may be set to direct the air flow all right, all left, or any combination of directions.

Grille bars and deflecting vanes are easily adjusted with tool accompanying each shipment.

Always leading. Always progressing.

42C

The INDEPENDENT REGISTER Co.
3747 East 93rd Street • Cleveland, Ohio

New Literature

For your convenience in obtaining copies of new Literature use the coupon on page. 91.

240—Furnaces and Repair Parts

Round Oak Company, Dowagiac, Michigan, has prepared a broadside covering their furnaces, blower-filter units, oil burners and furnace repair parts. The folder carries a letter for furnace dealers urging action in placing stock order for furnaces covering requirements during the balance of this year.

241—1942 Calendar

David Levow, 308 W. 20th Street, New York City (Roofers' and Tinners' Supplies), offers his 1942 calendars, while the supply lasts.

These calendars have on the last page important reference tables especially compiled for the trade, giving information on United States Standard Revised Comparison of Wire Gauges; Expansion and Contraction; Diameters, circumferences and areas of circles; Contents of round tanks; Physical properties of metals; Sizes of drills to be used for corresponding U. S. Standard taps; Slopes of Roofs; also weights and measures and useful rules of calculation.

242—Thor Portable Electric Tools

Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, is distributing Catalog No. 37 in four major sections, printed in two colors and illustrated with photographs of tools in operation on various types of work as a guide to the selection of proper equipment for different applications.

The book gives descriptions, specifications and prices on the entire Thor line of universal type electric drills, drill stands, screw drivers, nut setters, tappers, saws, hammers,

grinders, sanders, polishers and electric tool accessories.

Featured are the Thor ¼- and ½-inch capacity drills, the original small and light tools for fast drilling. In addition, the new Thor-Nado electric hammer and the Thor Nibbler for cutting metal are catalogued prominently.

243—Doall Operator's Guide Book

Continental Machines, Inc., Minneapolis, has available a new guide book for Doall operators entitled "A Chalk Talk on 40 Different Ways to Cut Machining Costs."

This guide book has been written especially for the thousands of machinists who are called upon to operate the Doall Contour Sawing Machines, with little or no training in contour machining.

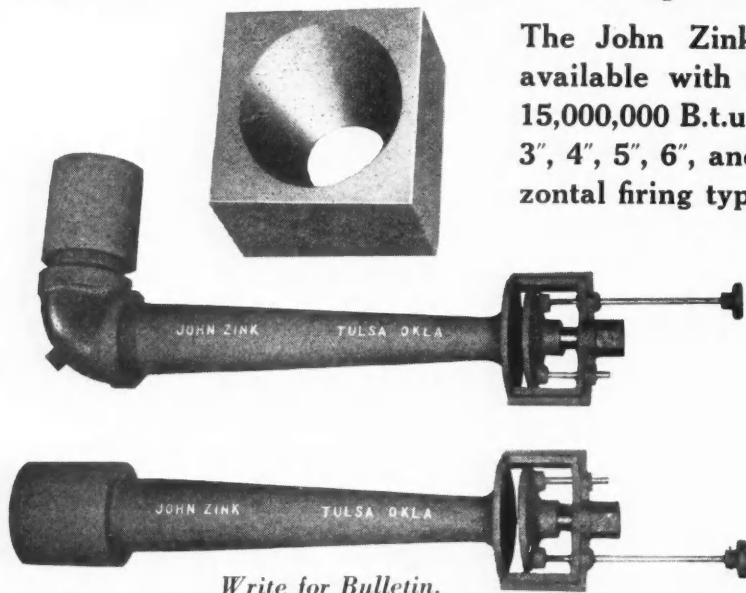
From this book, which is pocket size, containing 48 pages of illustrations, they are shown ways in which experienced Doall operators have saved themselves time and metal in their machining practices. A number of these ideas were formulated as a result of the experience gained at the Doall Trade School.

Each illustration is a "chalk talk" explanation concerning such operations as: how to stack parts in making stampings without dies, welding the saw band, how to grind and readjust saw guide inserts, use of mirrors in filing operations, speeding up template production, drafting symbols for sawing and filing operations, easy-to-make fixtures for sawing shells, and tube cutting.

For production jobs where speed and accuracy is of prime importance, a number of attachments are shown. These attachments, which are quickly mounted on the Doall, also contribute to the versatility of the machine.

Operators are shown how to operate such attachments when: they are required to cut true circles such as discs or rings, squaring or beveling small parts, how to miter, rip or do cutting of operations on one attachment, how to use a saw lubricator in cutting tough material, and the use of an etching pencil for marking parts finished on the machine.

John Zink Venturi Aspirating Gas Burners



The John Zink Aspirating Gas Burners are available with capacities of 200,000 B.t.u. to 15,000,000 B.t.u. per hour. Sizes 1¼", 1½", 2", 3", 4", 5", 6", and 8" in both Vertical and Horizontal firing types.

For firing Boilers, Stills, Oil Heaters, Pipe Bending and Heat Treating Furnaces, Kilns, Dryers, Special Heaters and Heaters where all air must be induced by burner. These burners require medium to high pressure gas for best operation and produce a clear blue flame pattern at high velocity.

Write for Bulletin.

Just this week four hundred and thirty-two of these burners were shipped to a large Government Project somewhere on the Gulf Coast.

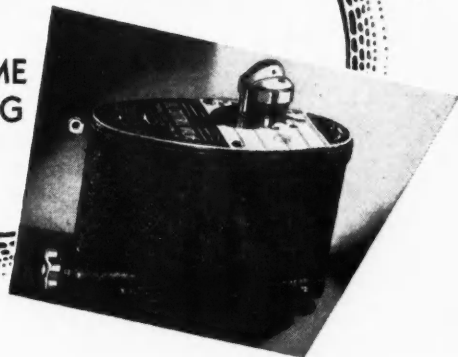
JOHN ZINK BURNERS

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**FUEL
ECONOMY..
GREATER
EFFICIENCY..**

Advantages of
**VAPORIZING TYPE
OIL BURNER**

for
**WARTIME
HEATING**



"More Heat per pound of metal" — is one good reason why Circulators, Hot Water Heaters and Furnaces using the VAPORIZING TYPE OIL BURNERS will be on the "preferred" list this year for Defense Housing Contractors, builders, and home owners. For War naturally high lights the importance of Economy in providing for the comfort of civilian workers and their families looking for truly modern heating.



DEPENDABLE OIL CONTROLS

offer important service in making these heating units completely dependable, economical, and "trouble-free"—offering complete customer satisfaction with a minimum of service attention. Used on the majority of Heating Appliances, A-P Controls are therefore a valuable sales feature that Dealers may use to great advantage.

Retailers! Write for your copy of the new "A-P Album of Space Heater Selling." You'll find it profitable in adding EXTRA sales and profits through more effective selling—and through new "Accessory" sales like the A-P THERMOSTATIC HEAT REGULATOR SETS so easily added to every A-P Equipped Heater.

AUTOMATIC PRODUCTS COMPANY
2452 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN

DEPENDABLE
Oil Control Valves



Lockformer Models 16, 18, 20, 22 and 24. Easy Edgers, Power Flangers and Power Flanger Attachments. Other sheet metal working equipment. Send for catalog.

Illustrated is Lockformer Model 22, equipped with Power Flanger Attachment.

● Lockformer owners everywhere take for granted the "money-making" ability of their Lockformer Equipment. They know that Lockformers pay for themselves quickly out of savings in time and labor costs.

● Now, these same owners are discovering that Lockformers can really "take it"—that they stand up under the stress of "speed-up" governmental building—under the strain of day in and day out hard usage.

● Whether you're buying your first Lockformer or your fifth, you can depend upon it to cut labor costs drastically—to give years of trouble free service. They're really "built for the duration."

ONE MAN AND A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WORKING AT EIGHT BRAKES.

The **LOCKFORMER Co.**
4617 ARTHINGTON STREET, CHICAGO, ILLINOIS

New Literature

For your convenience in obtaining copies of new Literature use the coupon on page. 91.

244—Lead and Tin Products

Alpha Metal & Rolling Mills, Inc., 363 Hudson Ave., Brooklyn, N. Y., offers a new folder "Alpha Lead and Tin Products" of varying alloys-solders, extruded shapes, pipe and tubing and many specialties frequently demanded by defense orders. The folder includes Lead-Tin alloy tables.

245—Fans—Attic, Window, Floor, Kitchen

Reed Unit-Fans, Inc., 811 St. Charles St., New Orleans, is distributing their new sales manual for 1942—Ventilation for homes, apartments, hotels, churches, clubs, restaurants, kitchens, offices, tourist courts, and many other applications.

246—Soldering Equipment

Eclipse Fuel Engineering Co., Rockford, Illinois, is distributing a leaflet showing their soldering furnaces. Bulletin No. G-3 also carries instructions for soldering, with a list of fluxes, soft solders and melting points—instructions for common soldering, four methods for soldering cast iron, four methods for soldering aluminum, and a method and warnings in soldering zinc.

247—Fans for 1942—Cat. Unit X4549

The Emerson Electric Mfg. Co., 1843 Washington Ave., St. Louis, is offering "The Book of Fan Values for 1942" a 28-page catalog illustrated in color, showing approximately 100 types of fans with complete data on construction features and performances.

The air Circulator line includes three-blade types S60WA and S60WB; also a four-blade type S60WC. Each of these fans is available with the four types of mounting accessories.

248—Catalog SD 1141 and Folder No. 5003

Utility Fan Corporation, Los Angeles, California, has just issued a complete new catalog on standard duty blowers. This catalog contains performance ratings on the complete Utility line of dynamically balanced blowers, dimensions, discharges and drive arrangements.

In addition to standard blowers, the Utility catalog illustrates and describes enclosed drive blower sets, two and triple blowers and other Utility Fan Corporation air moving equipment.

Also recently published is an illustrated folder showing all types of Utility air moving equipment, including blowers, spot fans, all year conditions, propeller fans and industrial exhausters.

249—Autovent's New Blower Catalog

Autovent Fan and Blower Division, The Herman Nelson Corporation, 1811 North Kostner Avenue, Chicago, has just released a new 76-page catalog, Number 303, describing Autovent Type H and Type HB centrifugal blowers.

The catalog is divided into two sections: Part I is an attractive 20-page bulletin printed in two colors and profusely illustrated with photographs of the blowers showing various drive arrangements and discharges, in both single inlet, single width and in double inlet, double width construction. The text explains construction features, bearings and performance characteristics of the Autovent Type H Blower, incorporating the forwardly curved blade wheel, and of the Autovent Type HB Blower, incorporating the backwardly curved blade (non-overloading type) wheel. Application of both types in heating, ventilating and air conditioning systems is described.

Part II of Catalog 303 consists of 40 pages of engineering data and capacity tables covering performances of Autovent Type H and Type HB Blowers at static pressures from $\frac{1}{8}$ to 5 in. In addition, 16 pages are devoted to dimension drawings illustrating 78 different views. Complete dimension data is furnished for all 17 sizes of these blowers.

New SERIES No. 3 **NIAGARA** POWER SQUARING SHEARS

Series No. 3 Niagara Shears operate at 80 strokes per minute. High production squaring and trimming are assured by the instant-acting sleeve clutch, quick, accurate gaging and convenient operation.

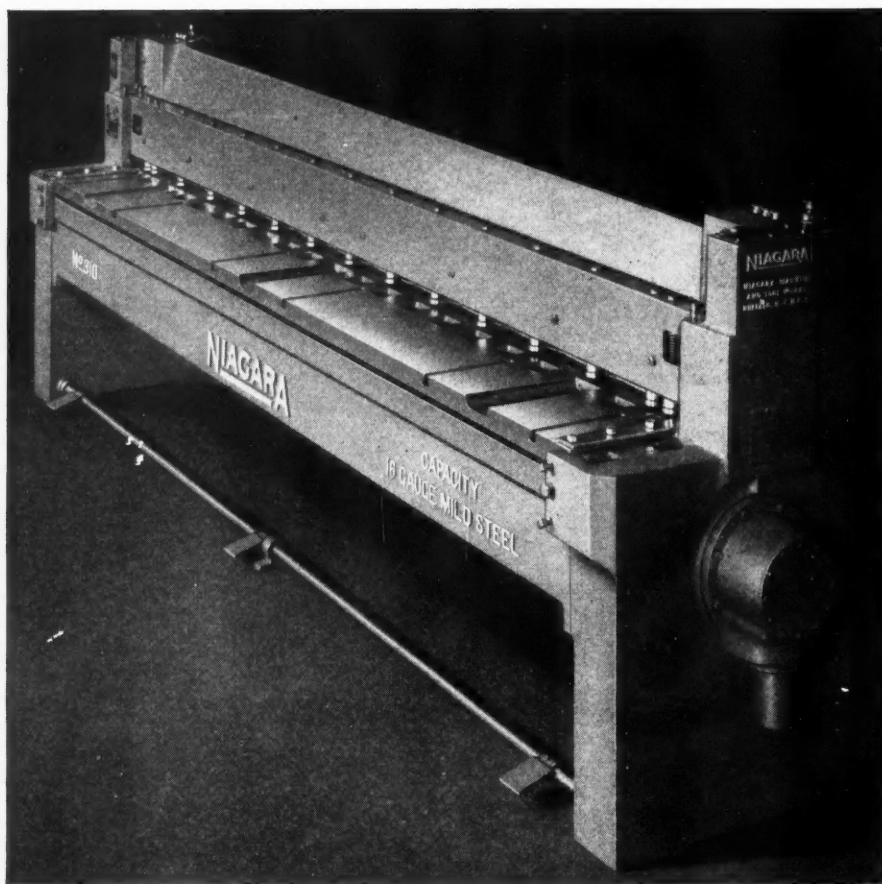
They cut sheared edges and narrow strips straight to within a very few thousandths of an inch.

Motor is direct connected and drive is enclosed in oil tight case.

Standard equipment includes ball-bearing, self-measuring parallel back gage, front and side gages, and four edge, solid tool steel knives.

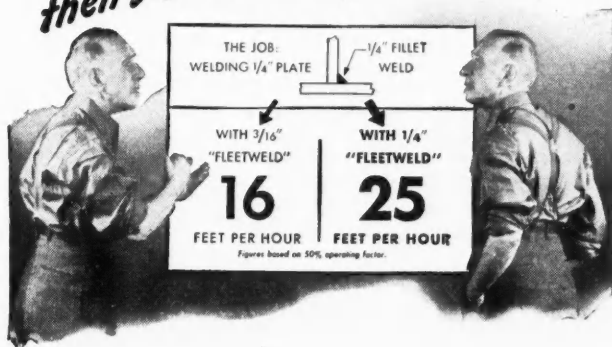
* * *

Niagara Machine & Tool Works, Buffalo, N. Y., Cleveland, Detroit, New York.



Capacities: 14 to 18 Gage. Cutting Lengths: 4 to 12 Feet

then I said to myself—



Here's a Way We Can Step Up Our WELDING PRODUCTION

What if we can't get new equipment right now? Why can't we figure out a way to boost production with our present welding equipment?

ALTER EGO: Here's a sure fire way: Get greater output by using larger electrodes!

Well, we have been using 3/16" electrodes since we started welding. What would we gain by using larger electrodes?

ALTER EGO: According to Lincoln, by stepping up 3/16" to 1/4", we would increase actual welding production an average of 50%.

What are we waiting for then? Why not step up the sizes? Would we have to make changes in our welding procedures?

ALTER EGO: On some of our jobs, all we would have to do is boost the amperage for the larger sized rods. On other jobs, we could arrange a simple fixture to position the work for flat, down-hand welding. Let's get some practical pointers from the Procedure Handbook published by The Lincoln Electric Company, Cleveland, Ohio. It gives many ways to DO MORE . . . FASTER.

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

PUNCH...

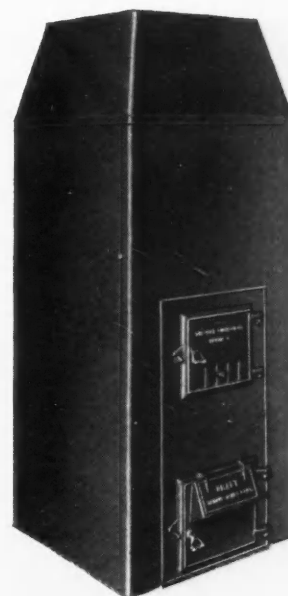
in the PINCH!



THE NEW
WISE FURNACE
FOR
DEFENSE HOME HEATING

That's what you need *now*! Competition is really tough for the defense home heating business and you have to back up your selling story with a furnace that will perform with the best in order to get your share of the business in your territory.

Wise now has available the compact cast-iron unit illustrated, for either coal or oil firing, and for gravity or forced air heating. The coal fired unit has a capacity of 44,880 Btu gravity and 66,000 Btu forced air. The oil-fired unit 49,000 Btu gravity and 75,000 Btu forced air. A special feature of this unit is the quick and cheap conversion from oil to coal firing if the occasion ever warrants it.

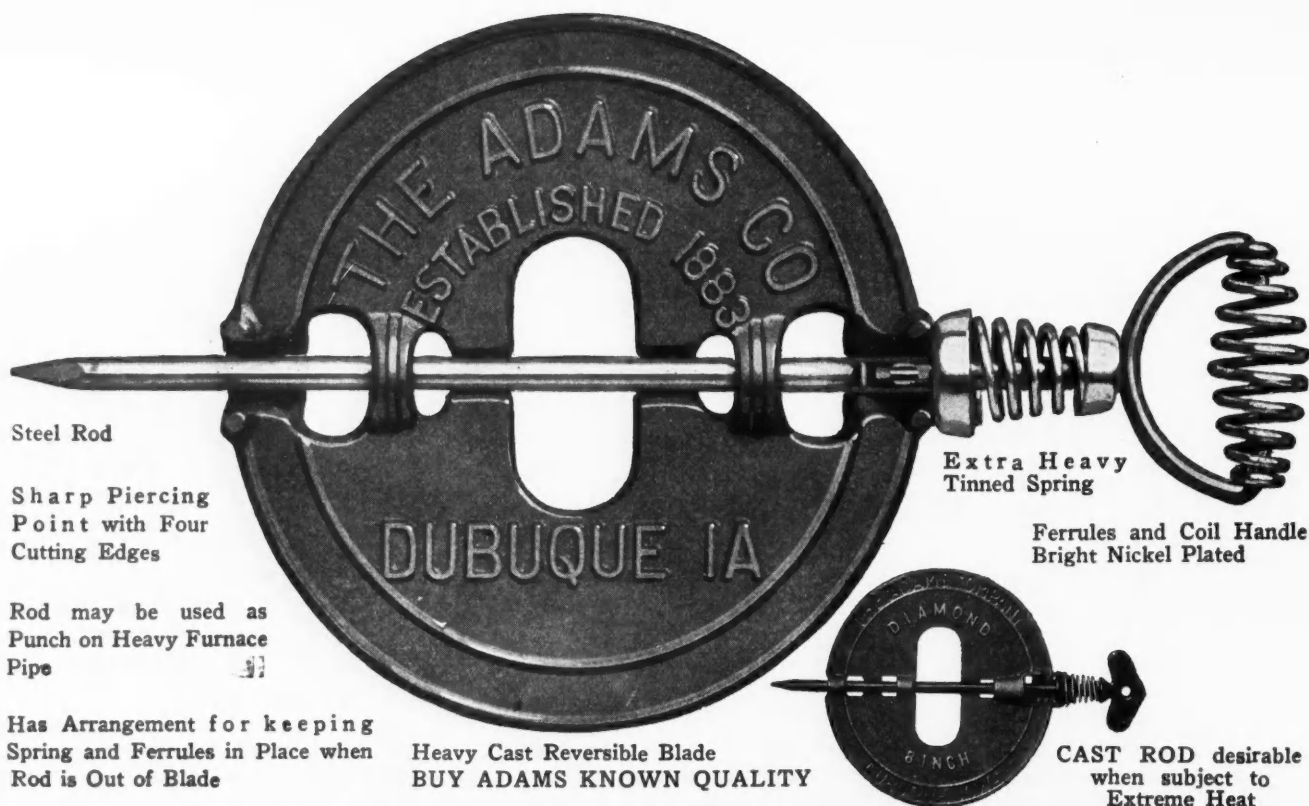


You'll find immediate acceptance of this unit and we suggest you acquaint yourself with it further. Write today for more information.

Write for literature!

THE WISE FURNACE COMPANY

AKRON - - OHIO



Steel Rod

Sharp Piercing Point with Four Cutting Edges

Rod may be used as Punch on Heavy Furnace Pipe

Has Arrangement for keeping Spring and Ferrules in Place when Rod is Out of Blade

Heavy Cast Reversible Blade
BUY ADAMS KNOWN QUALITY

Extra Heavy Tinned Spring

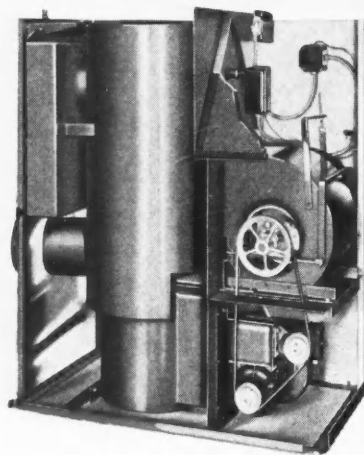
Ferrules and Coil Handle Bright Nickel Plated

CAST ROD desirable when subject to Extreme Heat

DIAMOND SMOKE PIPE DAMPER

Manufactured by **THE ADAMS COMPANY** Dubuque, Iowa, U. S. A.
ESTABLISHED 1883

There's No **PRIORITY** on **ECONOMY**



CONCO OIL-FIRED M-1 AIR CONDITIONER

Magic Spray Regulator — Magic Hand Controls — Efficient, Economical operation — Trouble-free — Long lived — Completely automatic — 3 models.

Both Uncle Sam and your prospects want to cut fuel consumption. There's no priority on economy! That's why now, more than ever before, the economy of the Conco Burner is a vital selling point. A Conco Airconditioner or Conversion Burner serves in these ways: 1. Its famed Magic Spray Regulator cuts fuel costs to the bone. 2. The higher quality construction of the Conco unit eliminates early repairs or replacements — cuts service calls. 3. Because these units are completely packaged, they are easily, quickly installed at a maximum profit for you. Write today for full details on the Conco line of coal, oil and gas-fired heating and airconditioning equipment.

Two Units — Two Models — All Sizes



CONVERSION BURNER

Models for small homes up to large apartments.

OIL AIR-CONDITIONER

Models for small, medium or large homes.



WRITE FOR IT TODAY!

CONCO CORPORATION

COAL OIL AND GAS HEAT
MENDOTA, ILLINOIS



Make Summer-time your profit-time. Conco's "Summer Sales Plan" tells you how!

**CONCO'S
SUMMER
SALES
PLAN FOR
DEALERS**

CONCO OIL-FIRED EQUIPMENT

WITH MAGIC SPRAY BURNER

MAGIC HAND CONTROLS By MINN.-HONEYWELL

SERVES HOMES up to 12 ROOMS

COMPLETELY PACKAGED

New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on this page.

250—Peerless Line of Blowers

The Peerless Electric Company, Warren, Ohio, is distributing Forms SDA91 and SDA92, describing and pricing the new line of blowers.

251—V-60 for Defense Housing

International Heater Company, Utica, N. Y., is distributing a 4-page folder illustrating and describing their V-60 for defense house heating. Specifications are included.

252—Coal Burning Furnaces

Wayne Oil Burner Corporation, Fort Wayne, Indiana, is distributing a 2-page folder covering their All American gravity and Victoria forced air furnaces.

253—Air Control

Air Control Products, Inc., Coopersville, Michigan, is distributing their new 1942 catalog—24 pages and covers—covering gravity and air conditioning registers and grilles, floor faces, floor registers, damper control sets, and attic louvers.

254—M-H Publication Features Priorities

Minneapolis-Honeywell Regulator Company, Minneapolis, in the current issue of "Temperature Times," for the Automatic Heating Industry, features priorities, with an insert showing the origin of priority business as it flows to jobbers, wholesalers, dealers and manufacturers.

255—1942 Industrial Roof Ventilator Catalog

The Swartwout Company, 18511 Euclid Avenue, Cleveland, Ohio, offers an appropriately indexed file folder containing Bulletin No. 214, 24 pages illustrating and describing the Swartwout line of roof ventilators for industrial and commercial buildings, and Bulletin No. 215, 16 pages, a comprehensive manual including guide for estimating building ventilation and roof ventilator requirements with instructions for installing Swartwout ventilators.

256—USG Chart to Figure Heating & Insulation

United States Gypsum Co., 300 W. Adams St., Chicago, offers a free chart which makes it easy to figure heating requirements to meet WPB defense housing critical list. War Production Board regulations limit the size of heating plants for Defense Houses; also heat loss. Insulation is the logical method of meeting these requirements. By thorough insulation, more metal is available for ammunition, tanks and jeeps. The government urges insulation for old houses, as well as new and U. S. Gypsum Company offers Red Top Insulating Wool blanket made of Fiberglas.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

50	51	52	53	54	55
234	235	236	237	238	239
241	242	243	244	245	246
248	249	250	251	252	253
255	256				254

Name

Company

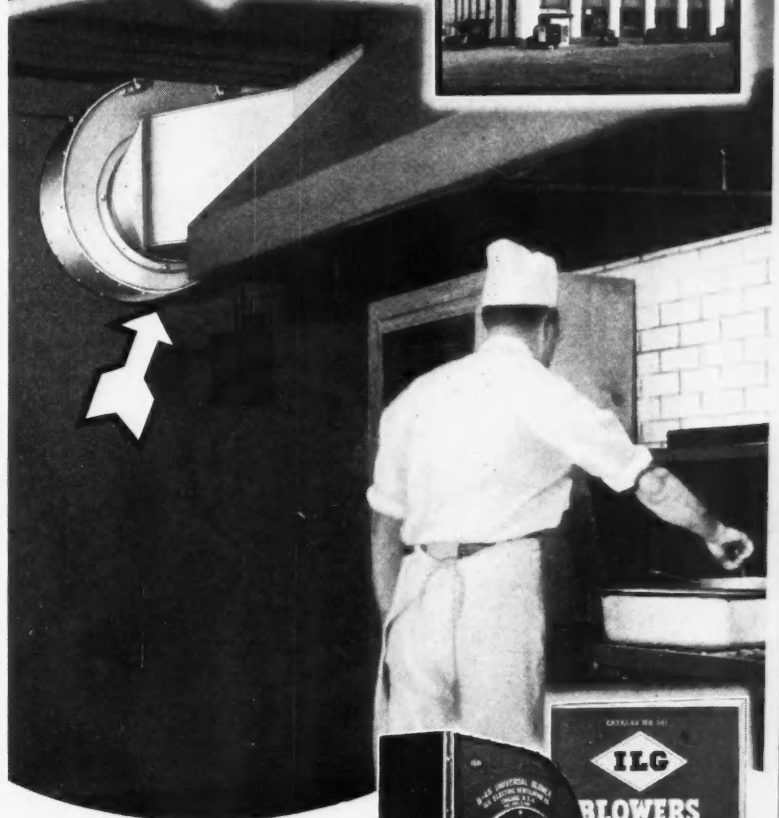
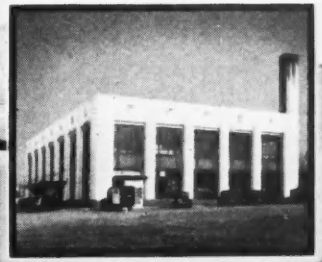
Address

Are you Manufacturer—Jobber—Dealer—

**HE MAKES FUMES DISAPPEAR,
KEEPS THE ATMOSPHERE CLEAR**



Convinced that they are easier to install and practically trouble-free, Mr. Walter Spohn of the Spohn Plumbing Co., Columbus, Ohio, has sold and installed many ILG Blowers in his 25 full years of successful experience in contracting.



ABOVE IS AN ILG B-25 Direct-Connected Blower removing fumes from kitchen range in one of six distributing plants operated by Isaly Dairy Co., Columbus. Another B-18 Blower in basement provides lavatory ventilation. Units have operated 18 or 24 hours a day for over 5 years with "minimum of attention." Follow the example of leading contractors like Walter Spohn who regularly specify "ILG"—save money, save time, minimize "trouble-shooting"—and protect yourself with ILG's exclusive "ONE-NAME-PLATE" guarantee.



FREE CATALOG AND DATA BOOK
Ask for No. 241

ILG ELECTRIC VENTILATING CO., 2871 N. CRAWFORD AVE., CHICAGO, ILL.
OFFICES IN 41 PRINCIPAL CITIES CONSULT YOUR PHONE DIRECTORY



Vitalized Ventilation

AND AIR CONDITIONING

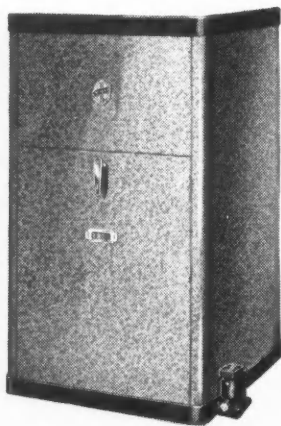
AIR CHANGE . . . NOT JUST AIR MOVEMENT!

New MONOGRAM

VICTORY MODEL

OIL BURNING FURNACE

For Low Cost Defense Home Heating

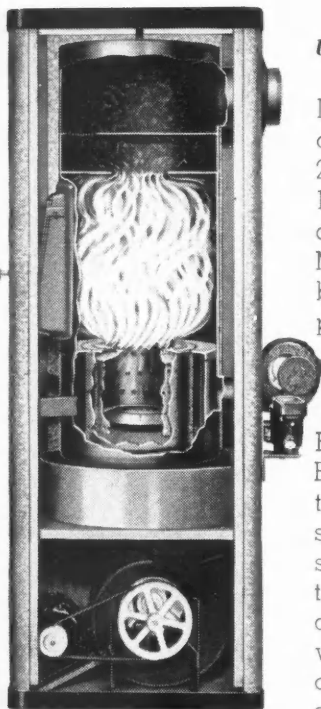


MODEL No. 73
*Manually Operated
Gravity Oil Furnace*

Insulated cabinet, one - inch Fiberglas, 26 $\frac{1}{4}$ x26 $\frac{1}{4}$ x50 $\frac{1}{4}$ inches high. 18-gauge combustion drum with exclusive MONOGRAM double baffle feature, made possible by a shorter, wider flame of the MONOGRAM patented Turbulent Flame Burner. 53,000 BTU output, finished

in brown ripple, heavy, durable construction.

MODEL No. 74—Same size and specifications as Model No. 73, illustrated above, except that it is equipped with the exclusive MONOGRAM Trimatic rheostat control which can be recessed in the floor above furnace or mounted on wall. This dial controls the oil input to the burner and controls the R.P.M. of blade fan, which provides mechanical draft and also boosts circulation and heated air. 63,000 BTU output.



MODEL No. 104
*Upright Full Forced Air
Oil Burning Furnace*

Insulated cabinet, one - inch Fiberglas, 27x27x66 inches high. 18-gauge combustion drum with exclusive MONOGRAM double baffle feature made possible by a shorter, wider flame of the MONOGRAM patented Turbulent Flame Burner. 70,000 BTU output. Limit control and blower switch. AP thermostat with oil-air control. Separate mechanical draft blower which operates only on high fire. Rex air control and blower for

forced circulation. Filters and humidifier, extra.

The Quincy Stove Mfg. Company
QUINCY ILLINOIS

With The Manufacturers . . .

Reynolds Corporation in New Location

Reynolds Corporation, Chicago, ventilating contractors and fabricators since 1881, is now in its new location—4224-28 South Lowe Avenue—with larger quarters.

Reynolds designs systems for humidifying, air washing, air filtering, fume exhaust, dust collecting, ventilating, drying, air treatment (cooling—heating); and fabricates metal work including hoods, hoppers, breechings, safety guards, louvres, ventilators, metal partitions, and specialties.

Mueller Entertains Students

On Wednesday, March 25th, a group of students from the graduating class of Michigan College of Mining and Technology, Houghton, Michigan, was conducted on a trip through the plant of the L. J. Mueller Furnace Co., Heating and Air Conditioning, 2005 W. Oklahoma Avenue,



Left to right: R. Junttila, D. Duke, G. Crothers, W. E. Haase (L. J. Mueller Furnace Co.), E. W. Niemi (Instructor), R. Parks, R. Durocher, A. Horujko, in the display room.

Milwaukee, Wis. Each spring a similar group of students from this school make an inspection trip through a number of industrial plants in Michigan and Wisconsin in order to see at first hand the designing and production of equipment pertinent to their course of study.

Flat-Rolled Products for Allegheny Ludlum

To effect closer coordination of its facilities, the Allegheny Ludlum Steel Corporation, Pittsburgh, has created a new Flat-Rolled Products department which will combine the Electrical and Carbon steels of its manufacture.

W. J. Adamson, formerly manager of Carbon steel sales, has been made manager of the enlarged department, according to R. M. Allen, General Sales Manager. In the same move, H. F. Porter was appointed assistant manager of the Electrical Materials Division, which remains as an integral division within the flat-rolled products group.

New Addresses for Six Lincoln Offices

The Lincoln Electric Company, 12818 Coit Road, Cleveland, announces new addresses for its Oklahoma City, Milwaukee, Chattanooga, Chicago, Omaha, and Dayton, Ohio, offices.

The Oklahoma City office is now located at 19 North Ellison Street. R. L. Looney, manager, will be assisted by O. L. Rogers and C. M. Bowen.

The Milwaukee office is at 733 North Van Buren Street. F. C. Archer continues as district manager.

R. M. Daniels is in charge of the Chattanooga office now located at 1111 James Building.

The Chicago office is now located at 323-325 East 23rd Street and G. E. Tenney continues as manager.

Fuchs Machinery & Supply Company, the Lincoln office in Omaha, has been moved to 521 South 15th Street.

The new address of the Dayton office is 246 Wiltshire Boulevard and R. P. Sharer is manager.

Personal Appointments

Penn Electric Switch Co., Goshen, Indiana, announces the appointment of **Harvey M. Olmstead** as the company's representative with an office at 1708 Sixteenth St., Denver, Colorado.

J. P. McIlhenny has been appointed sales manager of the General Electric air conditioning and commercial refrigeration department, Bloomfield, N. J., according to an announcement of J. P. Rainbault, manager of the department.

John L. Day, vice-president and general manager of **The Armstrong Company** of Detroit, Dallas and Chicago, died at his home in Hatfield, Mass., on April 4th.

Mr. Day started with Armstrong as a sales representative in 1926. He was popular throughout the industry and leaves many friends. His headquarters were in Detroit.

Ralph C. Cameron, long experienced in specialty selling and dealer relations, has been appointed Regional sales supervisor for the northern region of the **Airtemp Division of Chrysler Corporation**, Dayton, Ohio. Cameron succeeds **Jesse E. Hoyt**, who will take over important government contacts at Wright Field.

Major John Slezak of Sycamore, Illinois, has been assigned new duties as Chief of the Tank and Combat Vehicles Division of the Chicago Ordnance District, it was announced by Colonel Donald Armstrong, Deputy District Chief.

Major Slezak is on leave of absence from his position as president of Turner Brass Works.

Major Slezak helped to organize the Machine Tool Division of the Army-Navy Munitions Board while on a tour of duty in the Army during 1940.

The appointment of **W. R. Kuhn** to the district manager-ship of **Allegheny Ludlum Steel Corporation's** Cleveland Office has been announced by R. M. Allen, General Sales Manager.

Mr. Kuhn opened a Cleveland office for West Leechburg Steel Company in 1934, becoming district sales manager for the Allegheny Steel Company in Cleveland, when his former company entered the Allegheny fold in 1936.

Two years later, when Allegheny and Ludlum merged, Mr. Kuhn was made assistant district manager in the Cleveland office of the new corporation.

A. F. Hinrichsen, Inc., 50 Church Street, New York City, became the exclusive representatives of **Tuttle & Bailey, Inc.**, New Britain, Connecticut, for the metropolitan area on April 27, 1942. The Tuttle & Bailey New York office is being discontinued but the personnel of this office is being absorbed in the Hinrichsen organization.

This appointment covers the entire line of air conditioning, heating and ventilating material manufactured by Tuttle & Bailey—grilles, registers, air controlled devices, aerofuse ceiling diffusers and copper convectors.

The concern has been in operation since 1928 and is headed by A. F. Hinrichsen.

Research Products Corporation of Madison, Wisconsin announce the appointment of the following representatives for Research Filters:

Samuel E. Shea, 525 Ellicott Square, Buffalo, New York—Western part of State of New York.

Edward J. Allard, Swampscott, Mass.—State of Maine, New Hampshire, Massachusetts, and Rhode Island.

Robert L. Marks, 1228 College, Topeka, Kansas—State of Nebraska, Kansas and Oklahoma.

J. H. Valentine, 52 East 4th St. South, Salt Lake City, Utah—State of Utah, Eastern part of Nevada including the counties: Elko, White Pine and Lincoln, and the Southern part of Idaho, south of but not including Idaho County.

SKILSAW SANDERS give production the SPEED that leads to VICTORY!



SKILSAW MODEL "SL" SANDER-GRINDER. Grinds down fins on steel castings, smooths down welding beads.

SKILSAW MODEL "B" BELT SANDER. Cleans up castings, speeds up sanding. Powerful vacuum system picks up all dust.



SKILSAW "ZEPHYRPLANE" BELT SANDER. Swiftly removes scale and grit from flat surfaces of metals, wood and compositions.



SKILSAW MODEL "N" DISC SANDER. Quickly removes fins and scale from gray iron castings. Buffs and polishes.

Minutes were never before so precious . . . and SKILSAW SANDERS never so important as they are today. That's why you'll find them in America's busiest war-work plants . . . right at the front in the battle of production. 6 SKILSAW DISC SANDER Models to speed up all sanding, cleaning, grinding on flat, concave or convex surfaces. 4 SKILSAW BELT SANDER Models to do all sanding and polishing on flat surfaces . . . 10 times faster than by hand. Ask your distributor for a demonstration.

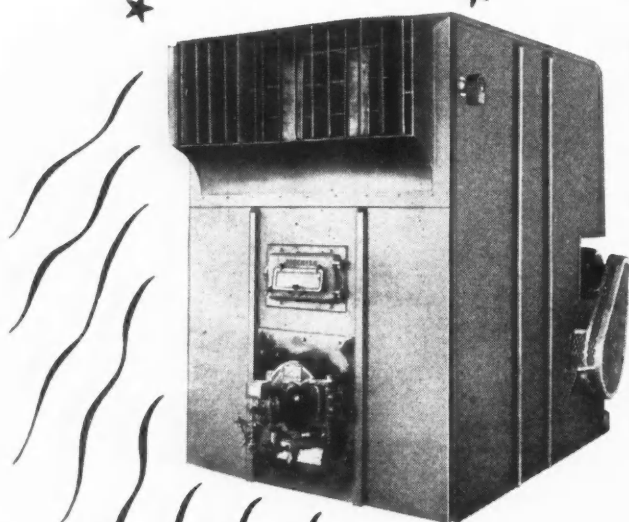
SKILSAW, INC.

5029 Elston Avenue, Chicago

New York, Boston, Buffalo, Philadelphia, Cleveland, Detroit, Indianapolis, St. Louis, Kansas City, Atlanta, New Orleans, Dallas, Los Angeles, Oakland, Seattle, Toronto, Canada

SKILSAW PORTABLE ELECTRIC **TOOLS**
★ MAKE AMERICA'S HANDS MORE PRODUCTIVE ★

★ THE ★ DIRECTHERM ★ HEATER ★



"TURNS ON THE HEAT"
ON WAR PRODUCTION

IF YOU work for Uncle Sam, you will have to solve your heating problem quickly and efficiently. There is no time for laying ducts, pipes, and for complicated installations. Uncle Sam can't wait.

Directtherm Heaters are self-contained units. They can be installed in a jiffy, and they utilize 80% of the fuel energy—just the right thing for war production plants.

Our ability to serve you depends on your priorities.

A I R T H E R M
MANUFACTURING COMPANY

706 S. SPRING AVE.

ST. LOUIS, MO.

Kruckman—National Housing Agency

(Continued from page 27)

of the Army and the munitions industries. They find their need for materials and manpower is increasing more swiftly each day, and that the actual needs today are far greater than was anticipated even a month ago. They particularly need critical materials, above everything else metals. *The metal shortage appears so acute that there seems to be a definite lack even as between the various War agencies without competitive requirements from the civilian industries that produce for secondary War needs.* Apparently there is not enough metal to go around for all actual War needs unless some War needs are further scaled down.

Private Steel Sales Under Investigation

The whole metal situation, likewise, especially as it concerns iron and steel, is confused and bewildering. There is a group within WPB which insists the prosecution of Carnegie-Illinois Steel and Jones-Laughlin Steel will sympathetically release considerable steel and iron which hitherto has leaked to unessential civilian sources from many different major steel and iron suppliers. They tell you the gross leakage last winter totalled far more than the Government was getting. There is obviously no way the facts may be ascertained except by the means the Government has

THESE ARE *Your Customers!*



YOU'LL SELL THEM FASTER

WITH

HESS

QUALITY EQUIPMENT

Defense workers, bankers, salesmen—these are your customers—people who appreciate the precision craftsmanship of the HESS line of quality heating equipment. You'll profit by HESS' financing and territory plan.

DEALERS:

Write TODAY for New 1942 Portfolio!

IN 1942 FEATURE—
selling, modernizing, replacements and repairing with

- ★ HESS Blower Filter Units
- ★ HESS Welded Steel Furnaces
- ★ HESS Automatic Oil Burners
- ★ HESS Automatic Coal Stokers

Quality Equipment from HESS
Costs Less!

HESS WARMING & VENTILATING CO.

1211 S. Western Avenue

CHICAGO, ILLINOIS

Founded 1873

initiated. The Department of Justice proceeding is expected to reveal some definite facts.

It is not anticipated War housing for workers will be eliminated. But some realists in Washington official groups hold that the present minimum standards for housing will be materially reduced, possibly far beyond even present expectations. The factor many persons do not take into consideration is the calculation by Leon Henderson, Donald Nelson, and others, that by next year War industries altogether will require the services of somewhere between 62,000,000 and 65,000,000 workers, and these figures do not include the armed forces nor the workers who must be employed on production for purely civilian needs, albeit these needs are expected rapidly to drop down to the production level of 1932.

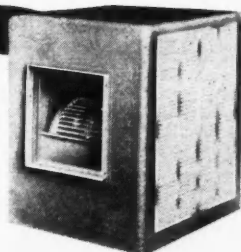
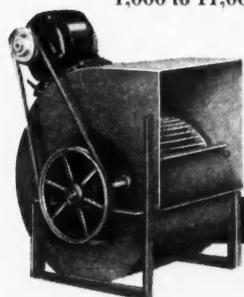
Temporary Buildings for War Workers

Sullivan Jones and his housing priority staff in WPB find it increasingly difficult, despite high priority ratings, to secure metal fabrications. This situation will unquestionably prompt the Requirements Committee to come to some sweeping decision. It is anticipated in some quarters this ruling may impose standards of such character that all War housing may be built only at Government expense. Barracks, shacks, and wholly temporary construction would scarcely justify investment of private capital.

Late in April, all officials of WPB and OPA and other agencies involved in housing were called to the White House for a prolonged conference. No word has yet come out as the result of that conference. It also is interesting that in the same week WPB issued an Order stopping the building of the new Federal Government central heating plant in the Capital. It

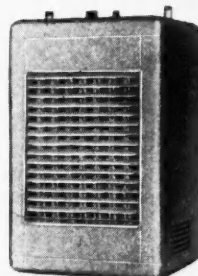
AIR COOLERS

15 Models
1,000 to 11,000 C.F.M.



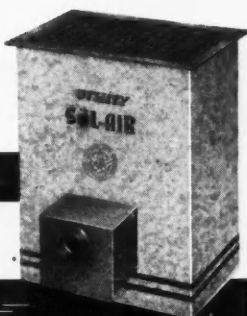
BLOWERS

Standard and heavy duty
blowers—6" to 66"



UNIT HEATERS

Blower and
fan types
Gas-fired
Self-Contained
Four sizes



FLOOR FURNACES

Floor and dual register models
Three sizes

Write for complete catalogs

UTILITY FAN CORPORATION

4851 S. Alameda St. Los Angeles, Calif.

HUSSEY COPPER

Hussey Copper has long been an integral part of America's finest equipment. Today Hussey Copper is meeting an even more vital need... our entire facilities and organization are devoted 100% to America's Victory Program.

Copper **HUSSEY** *Brass*

C. G. HUSSEY & COMPANY
(Division of Copper Range Co., Miners and Refiners of Pure Lake Copper)
Rolling Mills and General Offices: PITTSBURGH, PA.

If You Want Sales

... Check this list

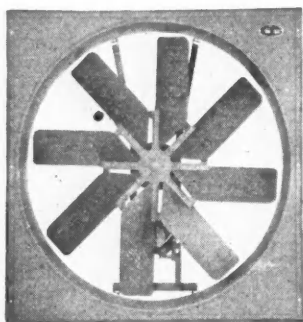
of Coolair

TRADE MARK

PROSPECTS

War Production Plants, Factories and Offices . . . Military Camps and Bases . . . War Housing Projects . . . Trade Schools . . . and civil necessity services and businesses such as—Hospitals . . . Laundries . . . Hotels . . . Recreation Halls . . . Theaters . . . Restaurants . . . Bakeries . . . and many other operations that can supply priority ratings.

This list of Coolair prospects gives an idea of the sales opportunities that are yours with Coolair in today's two greatest markets—war production plants and civil necessity operations. Coolair Breeze-Conditioning is an already established necessity for increasing employee efficiency and speeding production—that's why these Coolair prospects, knowing their need for proper ventilating and cooling, are ready and waiting to buy!



GENERAL PURPOSE FAN
In the 21 sizes of Coolair Fans, ranging from sixteen inches to nine feet in diameter, are units designed to meet every ventilating and cooling need. Welded steel frames, eight steel blades, sound absorbing springs, certified air delivery, oversize ball bearings and streamlined inlet insure efficient, economical operation and unequalled customer satisfaction.

ready established necessity for increasing employee efficiency and speeding production—that's why these Coolair prospects, knowing their need for proper ventilating and cooling, are ready and waiting to buy!

Get the facts about the opportunity Coolair offers you to keep your salesmen busy earning good commissions for themselves and profits for you! Write or wire today for the new Coolair Industrial Bulletin and franchise information.



MAIL THIS COUPON
Today!

Please rush me the new Coolair Bulletin and dealership information at once.

Name _____
Address _____
City _____ State _____



AMERICAN COOLAIR CORPORATION
Manufacturers . . . JACKSONVILLE, FLORIDA

was to supply heat next winter for war-swollen offices in the downtown area, and for the many more buildings that are being rushed to accommodate more workers. The present plant was built to serve 55 buildings. It serves over 130 under War conditions. If a severe winter comes to Washington this year "some Government workers will go cold," according to an official. When the Order came out it was justified on the grounds that the steel was needed for battleships.

And bear in mind the Work Battalion has appeared. The Work Battalion was known to us during the last War. It is composed of soldiers who are used as workers and live in barracks without families or encumbrances. The barracks have sketchy but adequate sanitary, bathing, and heating equipment. The Navy has had construction battalions for some time. They are colloquially known as the Seabees (CB). They even have their own insignia.

Sub-standard Heating in Offing

All this should give some hint of what may be in store for those who supply heating equipment. They tell you here that forced warm air, space heaters in the walls or the floors are indicated, and that solid fuels, mainly coal, will be specified in the furnaces of War housing. And they also point out that stoves and ranges have already been placed on the OPA Price Ceiling Cost-Of-Living list, which requires that their prices be prominently displayed in retail establishments. There are those who say War housing may even come to open fireplaces.

It may interest you to learn that the War plants going up in the cornfields are to be served by dormitories and barracks. Where family life is absolutely

FIRELINE all firepots

For Defense

Cracked and burned out firepots can be lined with Fireline, saving the installation of new castings. Good firepots should be lined to protect them for the duration.

Here's a fine opportunity for all furnace men to help the war program by conserving metal . . . to help their customers by saving them money on both castings and fuel . . . and to help themselves to a nice profit at the same time.

Send for the FACTS—right now—and get in on this new way to make money in the furnace business during these times.



FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury Street, Chicago, Ill.

unavoidable, it is purposed to use prefabs and trailers. Neither the prefab nor the trailer are looked upon with much favor by NHA. It is used only where the set-up is so fleetingly temporary that practically no form of permanent or semi-permanent housing could be justified. Also where speed is unavoidably imperative. Apparently the prefab which can locally use the A. F. of L. labor is preferred over the other.

All administration of construction matters in WPB has been vested in a new Bureau of Construction headed by W. V. Kahler. He will have general supervision over administration of the building stop order and similar activities that involve the business of the contractor and the subcontractor.

Konzo— Emergency Code

(Continued from page 52)

bonnet (or plenum chamber) some amount of heat is transferred from the ducts to the basement air. This heat loss in the duct system is commonly referred to as "duct transmission loss" or "duct heat loss."

The magnitude of this duct transmission loss varies with each installation; it is large for long duct systems, and small for short stubduct arrangements. From test data and from general

**PERFORATED
METALS**

•

**FOR ALL
INDUSTRIAL USES**

•

Perforations in

**HEAVY
PLATES**

•

DIAMOND MFG. CO.
BOX 29 WYOMING, PA.

NEW OIL FURNACE FOR WAR HOUSING PROJECTS



DU 42 and DU 44 PROVIDE OIL HEAT AT LOW COST!

You can solve some of your toughest heating problems with the new H. C. Little DU (Defense Unit) because this oil-fired Furnace Burner Unit is compact—low-cost—and easily installed. It culminates 12 years' experience with furnaces especially adapted to small homes.

MANY USES

Models are available for location in the basement or on the first floor—concealed, recessed, or in the open. They may be used with or without ducts—with or without fans for increasing warm air circulation. Operation can be Manual or fully Automatic. Capacities range from 40,000 BTU output to 70,000 BTU output.

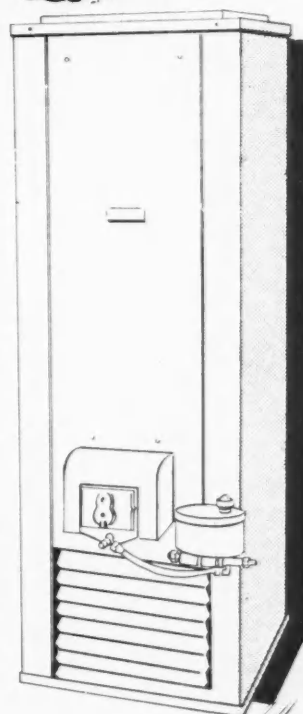
MANY ADVANTAGES

DU Furnaces' upright construction not only saves valuable floor space. It also makes a more efficient unit, in which a large volume of *warm* air is moved, instead of a small volume of *hot* air. Less stack draft is required, so lower chimneys may be used successfully. DU Furnaces are modern oil-burning units of practical design and high efficiency, at such low cost that they come within the most restricted budget.

YOU CAN BUY THEM NOW!

H. C. Little DU Furnaces are NOT AFFECTED by Limitation Order L-74 because they use a burner of the vaporizing type. With the correct Preference Rating you can buy DU Furnaces NOW. If you write today for full information, your request will get quick attention.

DU FURNACES ARE LISTED BY THE UNDERWRITERS' LABORATORIES



**H. C. Little
Burner Co.**
SAN RAFAEL
CALIFORNIA

Please send DU Unit literature

Name _____

Address _____

City _____

State _____

BUY WHITNEY-JENSEN METAL-WORKING MACHINERY and HAND TOOLS FOR LONG LIFE and ACCURACY

TOGGLE-ACTION FOOT PRESSES

7" 10" 18" 24" THROAT DEPTHS

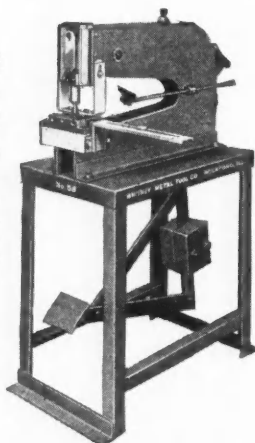
Simple, sturdy construction, light weight with plenty of strength, lasting accuracy, low cost, and availability for prompt shipment—these features make Whitney-Jensen Foot Presses a stand-out value for light punching and forming operations. Capacity 2" hole in 16 ga. iron, 100 holes per minute or better.

Write for Catalog



IMPROVED No. 17 BENCH PUNCH

New features: Throat depth now 6½" height of throat 1½". Jaws are welded steel plate. Weight reduced 30%. New depth and side gauges. Capacity ¼" hole in ¼" iron. A popular punch.



OVER 80 USEFUL ITEMS FOR SHEET METAL SHOPS

WHITNEY METAL TOOL COMPANY
91 FORBES STREET • ROCKFORD, ILLINOIS

Here's the Secret of Air Filter Profits!

Renew filters by simply removing clogged fibre sheets! It's as easy as that . . . with the RiP-CLEAN Air Filter!



RiP-CLEAN FILTERS Insure Efficient, Economical Air Filtration

For thrifty, effective air filtration, use Research RiP-CLEAN Air Filters, because:

1. YOU GET LONGER FILTER LIFE—RiP-CLEAN construction actually triples filter life!
2. THEY'RE SELF-SEALING—No tape, no gaskets, no by-pass of air!
3. THEY'RE RE-FIL-ABLE—Only the filter pad need be renewed, cutting out waste!

For Full Data and Sales Helps, Write
RESEARCH PRODUCTS CORP.,
MADISON, WIS.

acceptance in the field the duct transmission losses have been assumed to be of the following magnitude:

Forced-air systems—15%

Gravity warm air systems—25%

If the bonnet capacity of a furnace has been established, either by test or by code rating methods, the register delivery can be determined as follows:

$$\begin{array}{l} \text{Register} = \text{Net output} \\ \text{Delivery} = \text{Capacity} = : \end{array}$$

0.75 × bonnet capacity for gravity

0.85 × bonnet capacity for forced air.

Hence the manufacturer's rating of an oil fired furnace should give the following values:

a) Forced-air

Bonnet capacity = 94,200 B.t.u. per hr.
(established by test)

Net output capacity = $0.85 \times 94,200 =$
80,000 B.t.u. per hr.

b) Gravity

Bonnet capacity = 94,200 B.t.u. per hr.

Net output capacity = $0.75 \times 94,200 =$
70,600 B.t.u. per hr.

The relationships and terms given in the preceding discussion have been incorporated in the critical list of February 24th, 1942. A further discussion of furnace ratings will be given in the next issue.

LIBERT Hi-Speed SHEAR Speeds Up "VICTORY" Production in Sheet Metal Shops

With the "heat on" in War Production you'll "keep pace" on Sheet Metal shearing—with a LIBERT . . . Shears a greater variety of plain or irregular shapes—faster, more accurately, easier, even with inexperienced labor . . . Offers flexibility and versatility that cuts production time.

Clean cut edges avoid finishing costs. Write for bulletin or demonstration.



Model 1036, 36" throat, No. 10 gauge capacity in mild steel.

★ ★
LIBERT MACHINE CO.
Green Bay, Wisconsin
Manufacturers of
Quality Shears
Since 1915

Libert Hi-Speed SHEAR

Defense Developments

(Continued from page 29)

and commercial purposes and for house heating and water heating.

In answer to numerous questions to the Consumer Division as a result of this order, the following are suggestions for home owners:

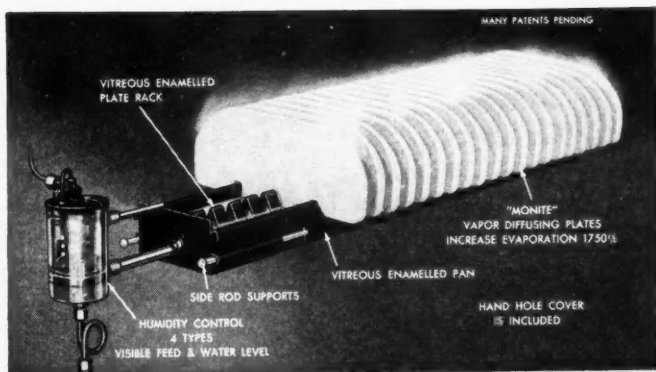
1. Home owners in these states who have coal boilers and furnaces which have been converted to oil, and for which grates are on hand or available from manufacturers, should install grates now. In addition, they should order their coal for next heating season now.

2. Householders in these states who up to now have planned to use any type of oil heating equipment next winter, including oil-fired "space heaters" and parlor stoves, should consider switching to stoves which will be fired by wood, coal, or coke.

3. Where possible, water heating equipment fired by wood, coal, or coke should be used in place of water heating equipment fired by kerosene or fuel oil.

4. Home owners who continue to use fuel oil or kerosene for house heating and water heating in the affected states, should make especially intensive efforts to avoid wasting fuel.

Indications are that as the war continues there may be need for additional steps to curtail the consumption of petroleum products in the Pacific Northwestern and the Atlantic Coast States.



MONMOUTH HUMIDIFIERS

For Success in Selling

Have strongest "Buy Appeal," the lure of modern design, modern plastic structure, visible feed rate, visible water level, etc.

For Success in Operation

Engineered like a Garand rifle. Corrosion-proof, lime-proof, failure-proof, no guesswork as to capacity.

Get Valuable Free Folio

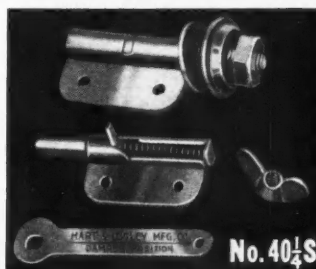
On adapting your business for wartime survival. You need it.

MONMOUTH PRODUCTS COMPANY
1933 East 61st St., Cleveland, Ohio

MONMOUTH

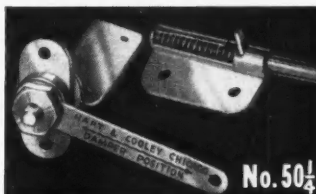
The Greatest Name in Humidification

H&C DAMPER REGULATOR SETS



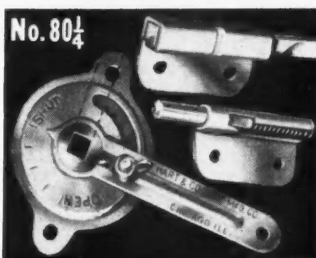
ECONOMY TYPE. Three ways to install: 1. With lock nut but without handle (for tamper-proof setting). 2. With handle and lock nut. 3. With handle and wing nut. Nut prevents damper vibration. Handle always indicates position of damper (Patent 2,146,142). Furnished with handy snap end bearing. Complete set in carton. Made only with 1/4" bearings.

LIST PRICE.....No. 40 1/4 S.....\$0.30



BRACKET TYPE. Nut holds damper securely, preventing vibration. Handle which indicates position of damper, may be left in place permanently or removed after adjustment (to prevent tampering). Snap End Bearing on 1/4" size, Solid Bearing on 3/8" size. Each set individually packaged.

LIST PRICES.....No. 50 1/4.....\$0.40
No. 50 3/8.....\$0.60



DISK TYPE. Like all H&C sets, this set is equally adaptable to splitter or regular dampers. Snap End Bearing on 1/4" size, Solid Bearing on 3/8" size. All parts are rust proofed. Complete set in carton.

LIST PRICES.....No. 80 1/4.....\$0.40
No. 80 3/8.....\$0.60

See your jobber or write for literature and sample.

HART & COOLEY MANUFACTURING CO.
HOLLAND, MICHIGAN · CHICAGO OFFICE: 61 W. KINZIE ST.



GENERAL CONTROLS MANUAL RESET SWITCH TYPE THERMOPILOT

Provides Complete, Safe Control in Case of Pilot-Flame Failure for Domestic and Industrial Gas Applications



The A-100-5 Thermopilot operates on the proved thermocouple principle. The flame being applied to the thermocouple element maintains electrical contact when manually set, closing the circuit to the main gas valve. When the pilot gas flame fails, the Thermopilot opens the circuit, causing the gas valve to close. The A-100-5, being of the manual reset type must be manually reset after pilot flame is relighted or restored. When the button is pressed, armature and core are engaged and contacts will not be made until safe condition at pilot exists and release of button engages contacts. No adjustments need be made for installations; all parts are sealed. Contact ratings: 10 amps. at 115V.

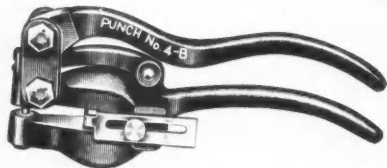
Ask for Catalog No. 51



GENERAL CONTROLS

801 ALLEN AVENUE • GLENDALE, CALIFORNIA
Branch Offices: Boston • New York • Philadelphia
Atlanta • Cleveland • Detroit • Chicago • Kansas City
Houston • Dallas • San Francisco

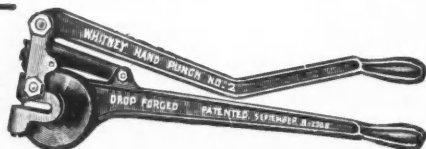
WHITNEY LEVER PUNCHES



**NUMBER
FOUR "B"
PUNCH**

This punch for sheet metal work has a capacity of $\frac{1}{4}$ " through 16 gauge. Weight 3 lb. Length $8\frac{1}{2}$ ". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop—the No. 2 Punch. Length 23". Capacity $\frac{5}{16}$ " through $\frac{1}{4}$ " iron, weight 12 lbs., depth of throat 1-11/16". Punches and dies $\frac{3}{32}$ " to $\frac{1}{2}$ " by $\frac{1}{64}$ ".



**NUMBER TWO
PUNCH**

W.A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

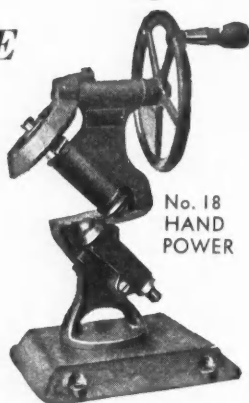
BOOST PRODUCTION SCHEDULES WITH

MARSHALLTOWN THROATLESS SHEARS

★
CUT ANY SHAPE

★
CUT ANY SIZE
SHEET

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. No matter what type of cutting—either irregular shapes or straight splitting—from ANY size sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.



No. 18
HAND
POWER

Get Special Shear Bulletin today. Gives details of sizes from 18 gauge to one-half inch capacity.

MARSHALLTOWN MFG. COMPANY

920 E. Nevada St., Marshalltown, Iowa

Defense Housing Critical List

(Continued from page 37)

b. Two sizes of coal furnaces should cover the range of output capacities.

1. Maximum 80,000 B.t.u. per hr.
Minimum $\frac{2}{3}(80,000) = 53,330$ B.t.u.
per hr.
(These are register deliveries)

2. Maximum 53,330 B.t.u. per hr.
Minimum $\frac{2}{3}(53,330) = 35,560$ B.t.u.
per hr.

c. In a gravity furnace the leader capacities would then be approximately

$\frac{80,000}{136 \times 1.1} = 545$ sq. in.

This furnace would cover the range from 535 sq. in. to 356 sq. in. leader pipe requirements.

$\frac{53,330}{136 \times 1.1} = 356$ sq. in.

This furnace would cover the range from 356 sq. in. to 237 sq. in. leader pipe requirements.

**INDUSTRIAL and
ORNAMENTAL**

Perforated METALS

H. & K. ENLISTS

... all its facilities and a wealth of experience in the perforating of metals and other sheet materials to further the essentials of war. Round hole perforations are available in a wide range from as small as .020" dia. to 7" dia.—slot and oblong holes are made as narrow as .008" and as wide as required. Write us for any information needed.

ANY METAL—ANY PERFORATION

**The Harrington & King
PERFORATING CO.**
5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

Gravity Furnace In a Row House

(Continued from page 49)

scribed, temperatures in all rooms can be adjusted.

Up to now the practice has been to make the return air system an "open" system; air is "dumped" into the open basement from the living room and dining room on the first floor and from the three second floor bedrooms through two stacks as shown on the plans. The return system, then, acts as a pressure relief rather than as a suction intake. Where oil is the fuel, this return system met Philadelphia area requirements; if coal is used, the return system must be closed to prevent smoke and dust penetration and panned joists with necessary boxed lines would be used.

For coal, Wampler is now offering the builder two alternate cold air plans. One plan uses a single cold air face or two cold air faces in the first floor and completely pipes the return air back to the furnace. The alternate plan omits all return air from either first or second floor and employs an opening in the casing to take air from the basement.

• Sheet Metal Design Books for Sale

Lester Muenchow, 316 N. 114th St., Milwaukee, Wisconsin, offers for sale a copy of "Standard Practice in Sheet Metal Work," like new. Also a complete course in sheet metal design and layout by St. Louis Technical Institute in excellent condition.

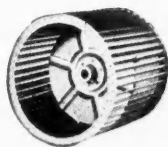
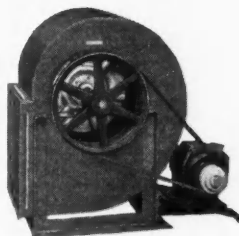
YOUR BLOWER REQUIREMENTS

available at

Schwitzer-Cummins Company

• BLOWERS FOR EVERY PURPOSE

HY-DUTY Blowers, 9 3/4" to 25".
Top and Bottom Horizontal, and Top
and Bottom Vertical Discharge.
Top and Bottom Motor Mounting.
Dual Units also available.

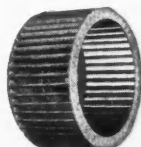


• CENTER DISC WHEEL

Double Inlet, Double Width.
Reinforced Center Disc.
Designed for Modern Air Conditioning and
Heating Applications.
Sizes, 4 1/2" to 50".

• SINGLE INLET WHEELS

For Oil Burner, Stoker, and Air Conditioning
Applications.
Sizes, 4 1/2" to 50".
Variety of Blade Lengths for each diameter.



• ENGINEERING DATA

Write for Catalogues showing complete Performance Data.
Experienced Engineering Department available to help solve your
Air Handling Problems.

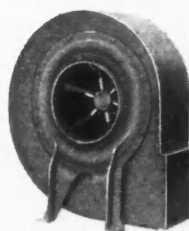
BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
125 FAN STREET INDIANAPOLIS, U. S. A.

Today's War-Time Industrial Market is Your BEST BET NOW

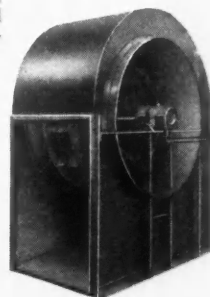


—LET CLARAGE EQUIPMENT HELP SELL THE JOBS!

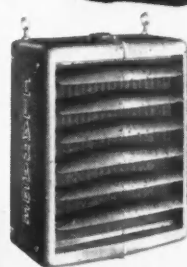
New war plants—and plants being converted—need heating, ventilating, exhaust and blow pipe installations. This high priority business can be your salvation. Specify Clarage Fans, Blowers, Unit Heaters—Nationally known and Nationally accepted, these highest quality air handling products help you land the jobs. Write for any information desired.



EXHAUST FANS



VENTILATING FANS



UNIT HEATERS

COMPLETE
AIR CONDITIONING
•
COOLING
•
VENTILATION
•
FACTORY HEATING
•
MECHANICAL DRAFT

FANS and BLOWERS
for INDUSTRIAL NEEDS

CLARAGE FAN COMPANY—KALAMAZOO, MICH.
SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



Premier FURNACE CLEANER

BUILDS UP SERVICE VOLUME!



The sturdy Premier Furnace and Boiler Cleaner works as your best ally in developing service business in volume—it gives you first-hand knowledge of needed repairs while it brings you profits on cleaning jobs! It's rugged and powerful, yet compact and light weight—easily carried and operated by one man. Business developing post cards are made available by Premier. Write today for complete information.

NEW IMPROVED MODELS

Completely Equipped

5 1/2 H. P. \$74.50

1 H. P. \$89.50

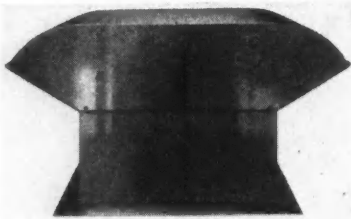
Complete chimney
cleaning equip-
ment only
\$10.00

**ELECTRIC VACUUM
CLEANER CO., INC.**

1730 Ivanhoe Rd. • Cleveland, O.

VENTILATION COSTS CUT FOR AMERICA

with New
ALLEN
Type "H"
ROOF FAN



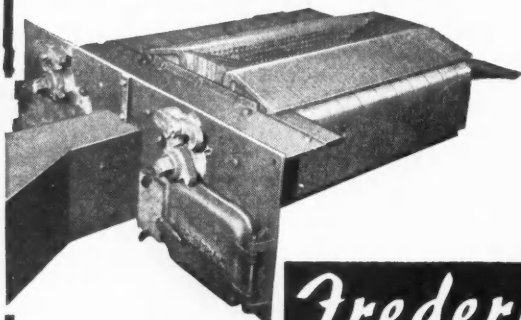
Low and compact in design, practical in function, this is the perfect answer for economical ventilation on all types of construction. Gives positive and controlled ventilation. Through scientific design, the air is pulled up by fan and forced against curved deflectors built into the insulated cover, and to counter-balanced discharge dampers which open and close automatically as fan is on or off. Being a cabinet unit complete with roof flange, it is easily installed. Ask for descriptive literature on the Type "H" Roof Fan!

The ALLEN Corporation

Ventilation Specialists

9752 ERWIN AVE., DETROIT, MICHIGAN

FULL ACTIVE GRATE SURFACE WITHOUT DEAD PLATES



MAINTAINS A LOW
COMBUSTION RATE
PER SQ. FT. OF AREA

**Frederick
STOKERS**

*More grate area, but low combustion rate per square foot of area! . . . Frederick Stokers have specially designed tuyeres with air ports so arranged and proportioned as to insure correct air distribution and maximum efficiency in combustion. Enclosed wind-boxes with two clean-out doors, another exclusive Frederick feature, eliminate possible air leakage through brickwork . . .

Yes, NEW FREDERICK STOKERS ARE DIFFERENT. A long list of original features distinguish them; many common stoker problems are solved by them. We suggest you write for complete description. Just send a note on your letterhead to

THE FREDERICK IRON & STEEL COMPANY

East Street, Frederick, Md.

BUILDERS OF FINE STOKERS FOR OVER 24 YEARS

Illinois' Convention

(Continued from page 78)

the other agencies letting contracts direct. The potential fabricator should visit his local office, file a facilities record, and then should maintain contact week by week, or as frequently as possible.

Revere's Roofloy

James F. Kittleman, Technical Advisor, Revere Copper & Brass Incorporated, briefly outlined the possibilities of Roofloy as a substitute material for copper. Mr. Kittleman said that a few months ago Roofloy was plentiful and it was hoped that this material could be substituted in large measure for customary copper applications. Unfortunately, this material is an alloy of lead and lead is getting scarcer and scarcer, so the prospective user can not now expect to get an unlimited supply, or material without priority.

Roofloy can be used as a substitute for copper without any change in specification, as a flashing, valley, but where the material is to be used as the full roof covering, some changes in the copper specification should be made. Roofloy has eliminated many of the previous faults of ordinary roofing lead, but nonetheless, it can not be used without change in specification for every application specified for copper. Contractors wishing to install Roofloy in place of copper should contact the representative of the manufacturer if possible. Many housing projects, financed by the government, or sponsored by the government, have

Get Your Copy of This New Designing Manual Now!

SECOND EDITION
PLATTE OVERTON'S

"FORCED AIR HEATING"

215 Pages—6" x 9"—Illustrated—\$1.00



Here is a book that will save you hours of time in the planning of your forced air heating jobs, as well as help you to avoid errors in your calculations. Outlined in it is a model procedure of design, based on wide experience, which you may follow with absolute confidence on any of your own jobs.

"Forced Air Heating" embodies all of the really worthwhile new data on forced air heating that has been developed through research and experience over the past several years. It illustrates by clear and concise examples the proper application of this new knowledge in actual designing work. Fifteen helpful charts, 23 time-saving formulas, and 19 practical tables are included with detailed explanation of their proper use.

Every contractor now doing or planning to get into forced air work should own a copy of this book. Send \$1.00 today to the address below for your copy. You may order with the privilege of returning the book within 10 days for a refund if it should for any reason prove unsatisfactory.

KEENEY PUBLISHING COMPANY

6 N. Michigan Ave.

Chicago, Illinois

used and are using Roofloy as a substitute for copper for built-in gutters, flashing, gravel stops, etc.

Repair Furnaces With Fireline

How to use Fireline cement properly, as a material to line broken or cracked combustion chambers, was briefly discussed by Dan Quinnan of the Fireline Company. In applying Fireline, the material should extend up over the lowest joint in order to seal the joint and the top edge should be feathered against the old firepot section. The lining material reduces the diameter of the firepot, but when the lining material is heated up, it retains its heat and transfers heat readily, so over a given period of time, the heat transmission from the fuel bed to the air is probably just as great with the lining in place as without the lining. As to cost, Mr. Quinnan declared that a good job of firepot lining ought to sell for approximately \$18. As to possible service, Mr. Quinnan said many Fireline jobs have been in place six to seven years and show absolutely no signs of deterioration. This material can also be used to patch holes and has even been used as partial sections supporting the combustion chamber and radiator above. In all cases, when the lining is installed, it should be dried by firing and not air dried. Another precaution is to leave the surface rough and not trowel the surface smooth.

A discussion of methods of installing substitute board as duct pieces was presented by Rudy Guenther of Accurate Manufacturing Company, using the black-board to demonstrate the various types of angles, strips, corners, cleats, now in use with substitute board. Since Mr. Guenther's ideas are presented in full and in diagram elsewhere in this issue, these diagrams will not be reproduced here.

LAMNECK PRODUCTS, INC.

Middletown, Ohio

**Manufacturers
and Fabricators of
SHEET METAL PRODUCTS**

Inquiries Solicited



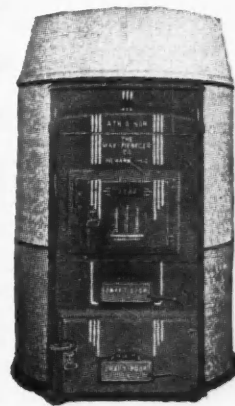
Since 1917 the source of the famous Lamneck Prefabricated Duct and Fittings. Lamneck Furnace Pipe and Fittings, also Silver Shield Silos and other farm storage equipment.

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Oh, a Jap! And you want to talk peace again? Say! Do you know who you're talking to? I'M the Field Control that's saving up to 25% of the fuel consumed in American heating plants. I'M the Field Control that has become a "best seller" with war restricted heating equipment dealers because I'm still available for sale to every home, school, store, church and factory in their communities. And by the way, Jap, before 1942 is over I'll be giving you REAL trouble! I'm profitable enough and have a large enough market to become the mainstay of practically every dealer in the country during these war restricted times.

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Field Controls are available because while requiring but little critical metal, they effect savings of vital fuel ranging up to 25%. The COMPLETE Field line—domestic and commercial—provides for complete coverage of your market. Write for complete information.

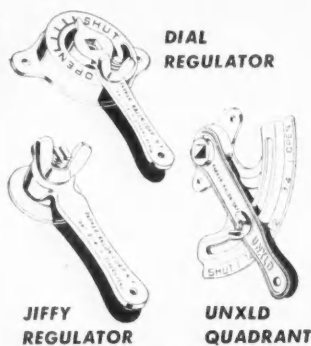


FIELD CONTROL DIVISION
MENDOTA, ILLINOIS



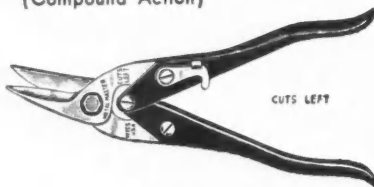
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For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 190-192 Varick Street, New York.



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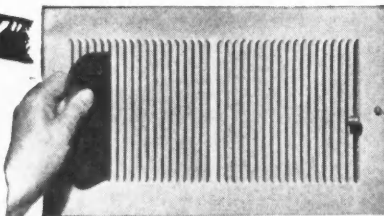
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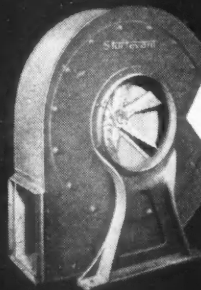
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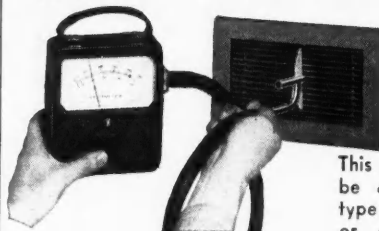
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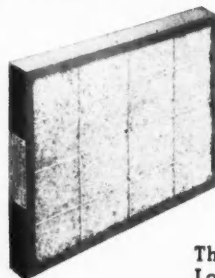
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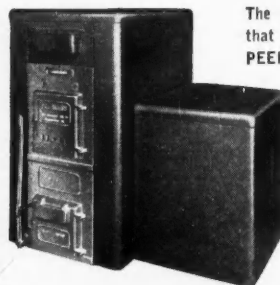


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P-84 Dissected

William Ogden of the Priorities Division, War Production Board, Peoria Office, explained in detail the order P-84, the long awaited repair and maintenance order for the furnace heating industry. Mr. Ogden went through P-84 in detail, but since P-84 was published completely in the April issue, only certain questions and answers will be reproduced here.


If the contractor finds the furnace is an obsolete model for which parts are not available, then it is perfectly lawful to have the homeowner certify and for the contractor to certify that a new furnace is required. If the original furnace was too small to heat the house, and if repairing this furnace will not satisfactorily heat the house, then replacement by a proper size furnace seems to be lawful, said Mr. Ogden.

As to why the A-10 rating is automatically granted, when an A-10 rating in many areas will not obtain materials, Mr. Ogden said everyone realizes this situation exists, and the only thing the contractor can do is to shop around and try and obtain sheets on an A-10 rating. If you find a source of supply which will not fill your A-10 order, then you are at liberty to ask War Production Board, Priorities Division, to investigate and compel delivery of your order. Mr. Ogden also announced that Limiting Order L-63 now replaces M-67 as the jobbers' inventory control order. The jobber uses application form PD-IX to obtain an inventory equal to twice his sales of the second preceding month.

The question was raised why certain mail order firms are requiring signature of the homeowner on every order even though the order is for a few cents and considerably under the \$5 minimum item cost specified in P-84. Mr. Ogden said this signature by the purchaser was not necessary; in fact War Production Board did not want signatures for less than \$5 order and no extension of a priority regulation was required for items under \$5. What the mail order people seemingly are doing is to build up a signed file of replacement and repair orders in order to prove that a certain percentage of their sale is for repair and replacement. Mr. Ogden said this was a very good idea and he showed copies of an order blank which states at the bottom "Material for maintenance, repair or operating supplies Rating A-10 under Preference Rating Order P-100 with the terms of which I am familiar" signed by the purchaser. And a second quotation on the same order blank "Material for emergency repairs of plumbing equipment or heating equipment, Rating A-10 under Preference Rating Order P-84, with the terms of which I am familiar, and signed by the contractor. Mr. Ogden suggested that it might not be amiss if all contractors would place such statements on their orders and sign them, sending the orders to the wholesaler and have the customer sign when getting the order.

Illinois' Licensing Bill

President Peterson reported that the Illinois State Licensing bill for heating contractors has been before the Judiciary Committee of the House. Gov. Green disapproved all such licensing bills without an appropriation clause and the legislature in the last session was not particularly favorable to appropriations. The bill has a good chance for consideration at the next session.



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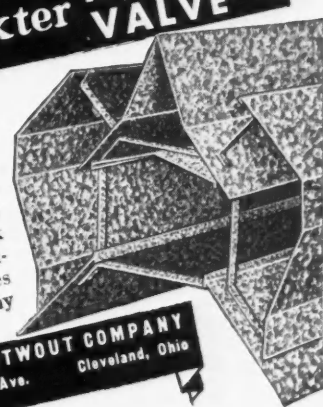
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because that is what your customers need today. Supply it with a furnace cleaning service. A Super Red Streak for good fast work gets you the repair jobs to make those old plants last longer and do better. It's a good paying business, as thousands of Super-equipped furnace men will testify. They tried Supers 5 days free. Same goes for you. Write The National Super Service Company, 1944 N. 13th Street, Toledo, Ohio.

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Takes an important part in helping industry meet today's heavy production demands. Recommend more roof ventilation to remove excessive heat, smoke and fumes so men can work easier, faster. Swartwout-Dexter Heat Valve solves the problem for many buildings.



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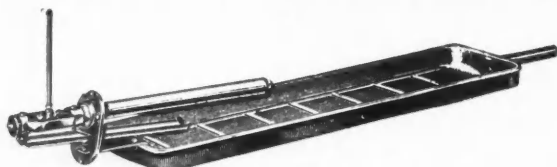
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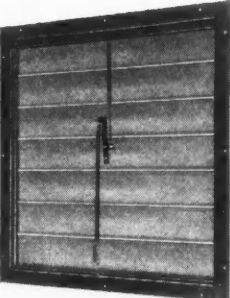
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Rear View (Closed)

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**Free
CATALOG**

Most Regulated— But Still Fighting

(Continued from page 25)

ment—provided FHA exercises a little judgment and acknowledges that beyond a certain point replacement is better than repair and—provided FHA admits that an undersized furnace never can do a satisfactory job of heating and a furnace of proper size should be installed.

3—There seems every likelihood of a large publicly financed and privately financed defense area new housing program. Makeshift stoves, heaters, fireplaces won't satisfy the American wage earner who now is making more money than ever before and has become our most particular buyer.

4—We'd all like to sell winter air conditioning systems and blowers and filters and humidifiers and controls and beautiful trunk line sheet metal work—but if we can't—we always could make money selling rightly priced gravity furnaces and we can do so again.

5—There may develop a big market for remodeling to provide additional housing for war workers—if so many old heating plants will have to be repaired, revamped, replaced, added to, in order to make living rooms out of attics and cold bed rooms.

6—There are still heating accessories not affected by any scarcities. For instance, most filters are still unrestricted and can be sold as replacement, even as new accessories.

7—Another accessory, insulation, is really not

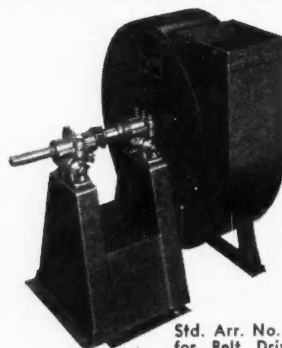
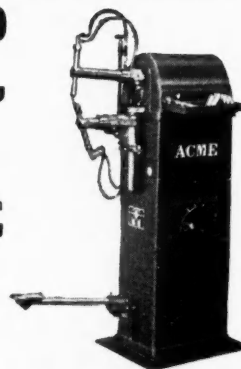
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Std. Arr. No. 1
for Belt Drive

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BAYLEY BLOWER COMPANY
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an accessory—but a full time activity. With new houses having to be insulated down to the capacity of the permitted furnace why shouldn't the furnace dealer sell insulation right along with the furnace. And in old houses where the original furnace was not large enough, but is too good to disturb, insulation in the attic floor will add the equivalent of several inches of firepot diameter.

8—Many firms already are busy; probably hundreds more will be busy; perhaps thousands will find work as sub-contractors or as prime contractors fabricating war products. What you can get, and how much, depends completely on each man's individual initiative and stick-to-it-iveness.

9—Industrial plant erection and enlargement still goes on apace. For how long, no one knows—but so long as expansion continues the fume removal, dust and waste material collection specialists will be busy.

10—There will be new outside sheet metal work in defense areas on houses and industrial buildings—not copper, probably, but of metal.

11—And outside sheet metal repairs on existing houses along with roofing must continue if America's houses are to be maintained.

12—And last in our list is the services we have worked up—service for oil burners, for stokers, for heating plants, for exterior drainage systems, for built-up and steep roofing, for control systems, for general repairs around the home, institution, store, restaurant, factory and so on—in short the usual maintenance work from which half our industry derives its bread and butter.

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1/2 lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.
ALEX. R. BENSON CO., INC., HUDSON, N. Y.

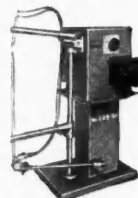
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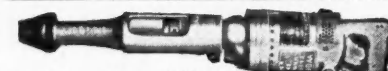
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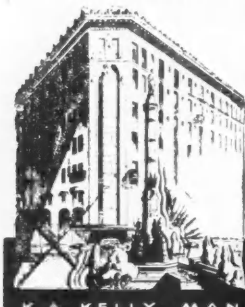
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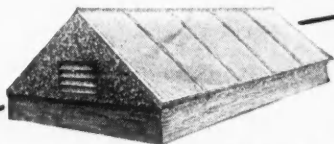
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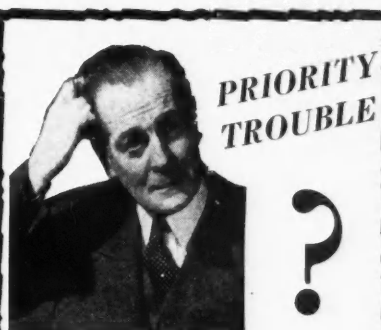
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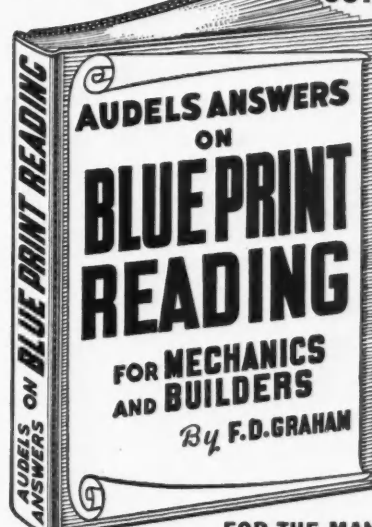
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FEDERAL—100 KVA Press Type, 21" thr.,

Hand oper.; 50 KVA, 26" throat.

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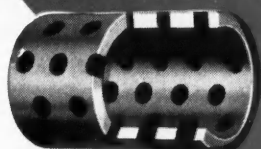
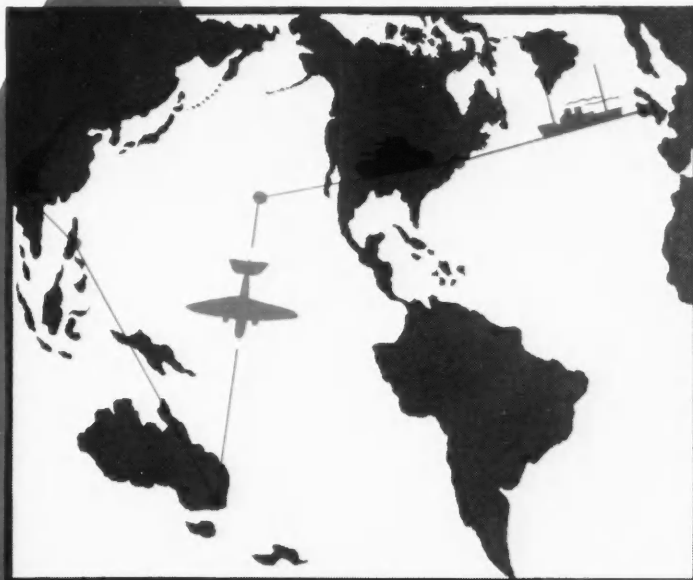
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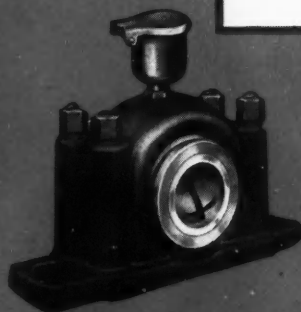
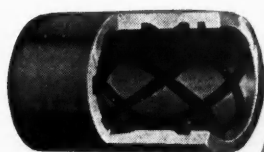
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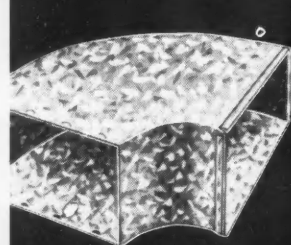
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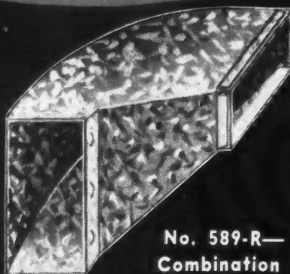
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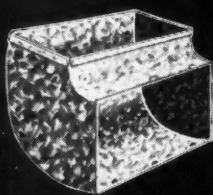
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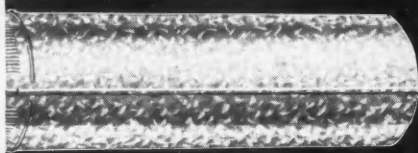
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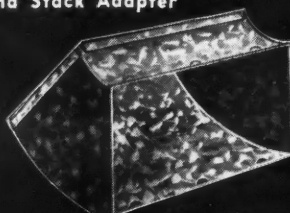
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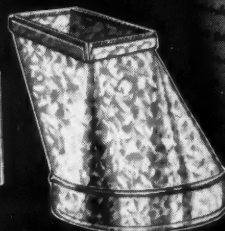
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